

# FLIGHT

The  
AIRCRAFT ENGINEER  
AND AIRSHIPS

First Aeronautical Weekly in the World. Founded January, 1909

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice and Progress of Aerial Locomotion and Transport

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

No. 1149. (Vol. XXIII. No. 1.)

JANUARY 2, 1931

Weekly, Price 6d.  
Post free, 7½d. Abroad, 8d.

Editorial Offices: 36, GREAT QUEEN STREET, KINGSWAY W.C.2.

Telephone: (2 lines), Holborn 3211 and 1884.

Telegrams: Truditur, Westcent, London.

Annual Subscription Rates, Post Free.

United Kingdom .. 33s. 0d. United States .. \$8.75.  
Other Countries .. 35s. 0d.\*

\* Foreign subscriptions must be remitted in British currency (See last Editorial Page.)

## CONTENTS

| Editorial Comment                    | PAGE |
|--------------------------------------|------|
| Three Lines .. .. .                  | 1    |
| Saro "Cutty Sark" .. .. .            | 3    |
| Focke-Wulf "Ente" .. .. .            | 4    |
| Puss Moth in Canada .. .. .          | 8    |
| Prudden-Whitehead Monoplane .. .. .  | 10   |
| Snapshots from South Africa .. .. .  | 11   |
| Private Flying and Club News .. .. . | 12   |
| Gliding .. .. .                      | 13   |
| Correspondence .. .. .               | 14   |
| Croydon Notes .. .. .                | 15   |
| Air Transport .. .. .                | 16   |
| Airisms from the Four Winds .. .. .  | 18   |
| Book Reviews .. .. .                 | 20   |
| Royal Air Force .. .. .              | 21   |
| De Havilland Notices .. .. .         | 22   |
| Air Ministry Notices .. .. .         | 22   |

## DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list—

1931

- Jan. 2 .. "Evaporative Cooling of Aero Engines," Lecture, by J. E. Ellor, before R.Ae.S., Hull.
- Jan. 7 .. "Early Aviation," Lecture, by E. C. Gordon England, before London Gliding Club.
- Jan. 8 .. "Some Aspects of the Design and Construction of Sea-Going Aircraft," Lecture, by A. Gouge, before R.Ae.S.
- Jan. 8 .. "Aircraft Production Methods in America," Lecture, by R. A. Bruce, before Westland Aircraft Soc.
- Jan. 14 .. "Armoured Cars in Desert Warfare," R.U.S.I. Lecture, by Sqdn.-Ldr. G. E. Godsave. 3 p.m.
- Jan. 17 .. Association Football: R.A.F. v. Corinthians, Wycombe.
- Jan. 22 .. "Deck Flying," Lecture, by Sqdn.-Ldr. W. R. D. Acland, before R.Ae.S.
- Jan. 22 .. "Model Aeroplanes," Lecture, by W. Rigby, before Westland Aircraft Soc.
- Jan. 28 .. "Glider Construction," Lecture, by C. H. Lowe-Wylde, before London Gliding Club.
- Jan. 28 .. Association Football: R.A.F. v. Football Assoc. XI., Uxbridge.
- Jan. 29 .. "Development and Construction of Sailplanes and Gliders," Lecture, by Herr A. Lippisch, before R.Ae.S.
- Jan. 29 .. "Machining and Working of Stainless Steel," Lecture, by R. Waddell, before Westland Aircraft Soc.
- Jan. 30 .. "Gliding and Soaring," Lecture, by Col. the Master of Sempill, before R.Ae.S., Hull.
- Feb. 5 .. "Wapiti in Australia," Lecture, by Sqdn.-Ldr. C. T. Anderson, before Westland Aircraft Soc.
- Feb. 6 .. De H. Aeronautical Technical School Ball, at Portman Rooms.

The Editor of FLIGHT tenders his sincere thanks and hearty reciprocation for the numerous Christmas and New Year greetings which have been sent from all parts of the world, by sea, land, and air. He earnestly hopes that 1931 will be a prosperous and Happy New Year for everyone.

## EDITORIAL COMMENT



IMPROVEMENT of aircraft, in the direction of increased aerodynamic efficiency, proceeds but slowly, but it does proceed. Now and again an aeroplane is produced in which a maximum L/D far in excess of the average is achieved. The Fairchild long-distance monoplane was one such type. Retractable undercarriages, Townend rings around radial engines, and engines arranged in the form of the letter "H," are other lines of development towards better aerodynamic efficiency. These, coupled with gradual "cleaning up" of the aircraft itself, may and almost certainly will bring commercial aviation closer to the day when it can "fly by itself," and are to be welcomed as aids to greater operational economy. Out of them it is likely that the fast mailplane of the future will emerge. Mr. Radcliffe, in his series of articles on the subject, has pointed the way. But with all our search for greater efficiency, are we getting much nearer to the aeroplane which is "safe"? This is the beginning of the new year, and therefore a time for resolutions. Might it not be a very good thing if one of our resolutions for 1931 were to be that we would treat more seriously the search for safety? The present tendency is, rightly and naturally, towards better performance of aircraft, commercial as well as private. But this better performance appears, in a large percentage of cases, to be attained by increased wing loading and increased landing speed. In commercial aircraft this is probably of no real serious consequence. Commercial aircraft are, as far as Great Britain concerned, flown by pilots of outstanding skill and very long experience, and another 10 miles per hour

added to the landing speed probably does not increase risk to any appreciable extent. In the case of aircraft for the private owner, the position is somewhat different. The future will probably show two classes—not, of course, with a very marked distinction between them—the private owner of considerable skill, who can safely handle the faster machine, and the less skilled owner who, for real safety, requires a type which he can “put down anywhere.” Thus, the high-efficiency type towards which we are now definitely tending will always be wanted, and will continue to develop. But just as certainly, a different type, not, perhaps, quite such a “thoroughbred,” will be required for the man who wishes to fly in comfort and safety, but who has no aspirations to achieve the skill of a Schneider pilot. To such as he, the greatest risk is still the stall and the spin which is ever likely to follow it. Low stalling speed reduces the risk a little, because the lightly-loaded machine does not lose as much height in recovering, but it does not altogether avoid the risk. The only way to do away entirely with the dangers following the stall is obviously so to design the machine that it cannot be stalled. Then, if the machine descends approximately on an even keel, it becomes largely a matter of undercarriage design whether no damage is done, or but little damage.

At the present time there are three distinct solutions in sight, all avoiding the stall and spin: The tailless type, the Cierva Autogiro type, and the tail-first type. (We are not including here the Handley-Page automatic slots because, although they do prevent the incipient spin, they do not prevent the stall.) Each of the three types mentioned has something in its favour, and something against it. It may be of interest to examine very briefly the main characteristics of the three.

The tailless type of aircraft is represented, as far as this country is concerned, chiefly by the Westland-Hill “Pterodactyl.” The principle upon which the design is based is to sweep the wings back at a pronounced angle, and at the same time gradually to decrease the angle of incidence from the centre of the wing towards the tips. The centre portion, being at a greater angle than the tips, reaches stalling before the outer wing portions, and so the wing as a whole loses lift but very gradually; and not suddenly, as in the orthodox straight wing.

In the “Autogiro,” Senor de la Cierva makes use, for his lifting surfaces, of rotating blades which are kept in motion by the air forces upon them. This makes it possible for the machine as a whole to remain almost stationary, but descending slowly, while the lifting surfaces continue to revolve and, therefore, to give lift. The all-but-vertical descent of the “Autogiro” cannot be quite equalled by any type of fixed-wing aircraft.

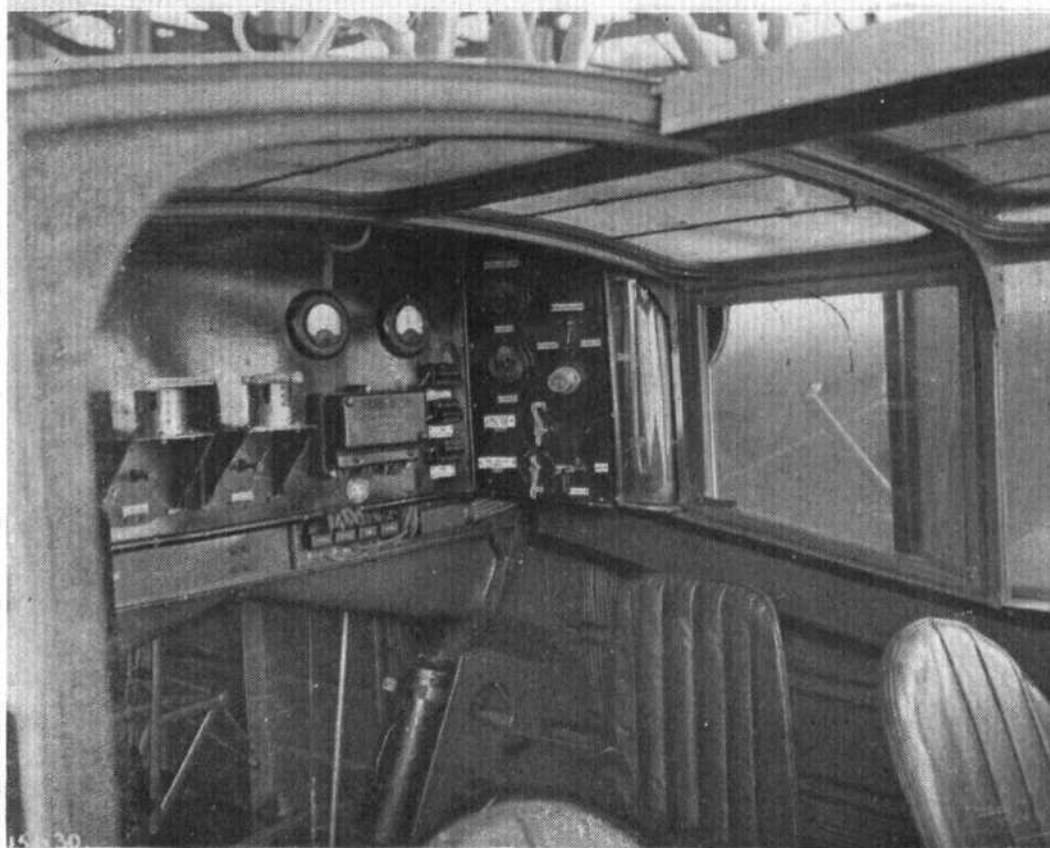
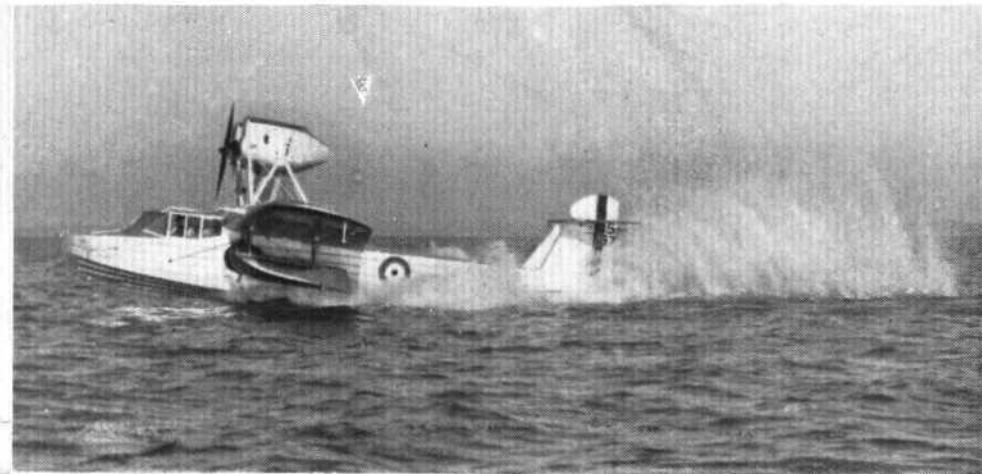
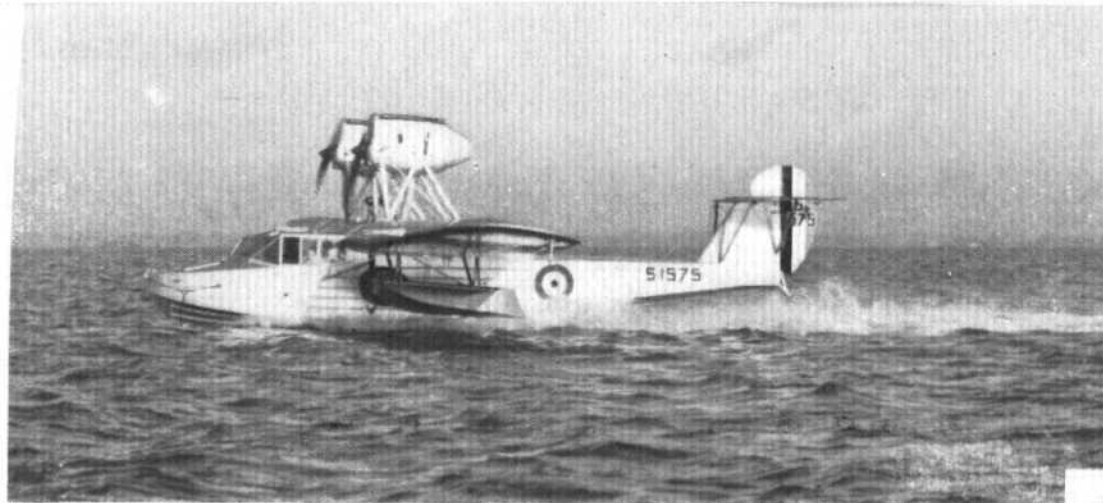
In the “tail-first” type of machine, such as the Focke-Wulf “Ente,” described and illustrated in this issue, the fundamental principle of design is that the load is divided between the main wing and the forward wing, the latter being much smaller than the main wing and, if the same aerofoil section be used in both, more heavily loaded per square foot of surface than the main wing. Thus, at any given speed, the forward wing must be at a greater angle of incidence than the main wing, in order to carry its load. The result is that the forward wing reaches stalling angle before the main wing does, the nose drops, and the machine gathers speed. The fact

that, during the stalling of the forward wing, the main wing is near its angle of maximum lift, means that the drop of the whole machine is probably small, and little height is lost before the machine is again flying normally.

Each of the three types has certain good features, and each has, as is but to be expected, certain drawbacks. There is no space here to go into great detail, nor is the Leader Page the proper place for a technically exhaustive treatment of the subject. But to help the more non-technically minded among our readers to a general understanding of the subject, it may be pointed out that the “tail-first” type of aircraft succeeds in avoiding the stall, and should be as efficient, aerodynamically, as the orthodox aircraft, but is a little difficult on the ground, where it is turned over as easily as is the normal type of machine. The “Autogiro” also is a little difficult on the ground, chiefly because of the impossibility of suddenly stopping the speed of the rotor blades. Thus a strong gust of wind striking the machine after it has landed, but before the brakes have succeeded in stopping the rotor, may turn the machine over. Against that drawback, however, must be placed the unique ability of the “Autogiro” to descend, nearly vertically, into a very restricted space. A forced landing can, in fact, be made with this type of machine in spaces which would be utterly impossible to ordinary aircraft, and to the “tail-first” type, although the “tailless” might approach it somewhat. Aerodynamically the “Autogiro” cannot readily be compared with the orthodox type, not because it is necessarily markedly inferior to it, but because its maximum efficiency occurs in a different part of the speed range, i.e., nearer the top and bottom ends of the speed scale.

The “tail-first” type can claim immunity from stalling (as it is ordinarily understood) and spinning and it would seem to score over both the “tailless” and “Autogiro” types in its stability on the ground. Owing to the fact that so much of the machine projects ahead of the centre of gravity, even the locking of the wheels by means of the brakes, or alighting on very rough and soft ground into which the wheels sink, will hardly turn the machine over. Thus it seems reasonable to assume that, provided the emergency landing ground is large enough, the “tail-first” type will make a safe landing. It is not likely to be able to get into as small a space as the other two types, because its very stability would seem to prevent it being brought down at low speed along a steep flight path. The Focke-Wulf “Ente” described this week is disappointing both in aerodynamic and structural efficiency, but we cannot believe that this is inevitable in the “tail-first” type, and is probably due in this case to the experimental nature of the machine. One not unimportant point is that it should, theoretically, be possible to save weight as compared, for instance, with a flying boat. The high centre of thrust in a flying boat has to be counteracted by a considerable down load on the tail. In a large flying boat this may amount to 1,000 lb. or more. This weight, of course, has to be carried by the wings. In the “tail-first” type not only is this weight saved, but the forward wing helps to carry its share of the weight. Without wishing to prophesy, and without belittling at all the respective advantages of the “tailless” and “Autogiro” types, we believe that the “tail-first” type is worth developing also in this country.





DECEMBER IN THE SOLENT: The upper photographs show, on the left, the Saro "Cutty Sark" taking off, and, on the right, alighting. Note the general "cleanness." The lower pictures show the cabin specially equipped for service use. (Photos by Beken and Son, Cowes.)



COMING OR GOING?: The "Ente" in flight. Note the plan form of the front plane.

## THE FOCKE-WULF "ENTE"

By EDWIN P. A. HEINZE

THE history of "canard" aeroplanes extends back to 1907, when Santos Dumont was the first pilot to carry out one or two short "hops" with this type of machine. About the same time Hinrich Focke, the present chief of the German Focke-Wulf Works, and his brother experimented with canard models and set up a theory of their working, leading to their applying for a patent, which was granted them in 1908. A machine was then constructed in the works of Dr. Rumpler, and equipped with a 40-h.p. engine. This machine carried out several short flights on a field near Berlin, in September, 1909, with Dr. Alberti at the controls. In the following year the Frenchman Voisin executed short flights with a similar plane, which was by him named "canard," meaning duck, this being derived from the peculiar aspect of the machine in the air looking

### FOCKE-WULF "ENTE" F.19a 2 Siemens Sh-14 Engines

| <i>Dimensions</i>                       |       | m.                       | ft.                | in. |
|---|-------|--------------------------|--------------------|-----|
| Length o.a.                             | .. .. | 10.53                    | 34                 | 6   |
| Wing span (main)                        | .. .. | 10.00                    | 32                 | 10  |
| Wing span (forward)                     | .. .. | 5.00                     | 16                 | 5   |
| <i>Areas</i>                            |       | sq. m.                   | sq. ft.            |     |
| Main wing surface                       | .. .. | 29.5                     | 317                |     |
| Forward wing surface                    | .. .. | 6.0                      | 64.6               |     |
| Total lifting surface                   | .. .. | 35.5                     | 381.6              |     |
| <i>Weights</i>                          |       | kg.                      | lb.                |     |
| Tare weight (equipped)                  | .. .. | 1,175                    | 2,585              |     |
| Disposable load                         | .. .. | 475                      | 1,045              |     |
| Gross weight                            | .. .. | 1,650                    | 3,630              |     |
| Wing loading                            | .. .. | 46.5 kg./m. <sup>2</sup> | 9.77 lb./sq. ft.   |     |
| Power loading                           | .. .. | 7.5 kg./P.S.             | 16.5 lb./h.p.      |     |
| "Wing Power"                            | .. .. | 6.2 P.S./m. <sup>2</sup> | 0.577 h.p./sq. ft. |     |
| <i>Performance</i>                      |       |                          |                    |     |
| Maximum speed                           | .. .. | 142 km./h.               | 88 m.p.h.          |     |
| Cruising speed                          | .. .. | 128 km./h.               | 80 m.p.h.          |     |
| Landing speed                           | .. .. | 83 km./h.                | 52 m.p.h.          |     |
| Climb to 1,000 m. (3,280 ft.)           | .. .. |                          | 8.3 min.           |     |
| Take-off run to 20 m. height            | .. .. |                          | 440 yds.           |     |
| Alighting run, from 20 m. to standstill | .. .. |                          | 450 yds.           |     |
| Everling "high-speed figure"            | .. .. |                          | 8                  |     |

like a flying duck. In 1911 the German Professor Reissner also carried through some promising attempts with a canard plane. Notwithstanding all these and many more less well-known attempts being relatively successful, none of these men succeeded in procuring the necessary financial support to enable them to continue work, for the now normal type of plane was quicker to mature to good performances.

There is always a prejudice against taking up for development old ideas that already once had to be dropped for apparent impracticability. This is no less so in Germany than elsewhere, and the fact that in 1925 the German Aeronautical Research Institute (Deutsche Versuchsanstalt für Luftfahrt), after very carefully considering proposals brought before it by Focke-Wulf, gave the latter makers an order for a canard plane was, therefore,



THE FOCKE-WULF "ENTE": Three-quarter front view.



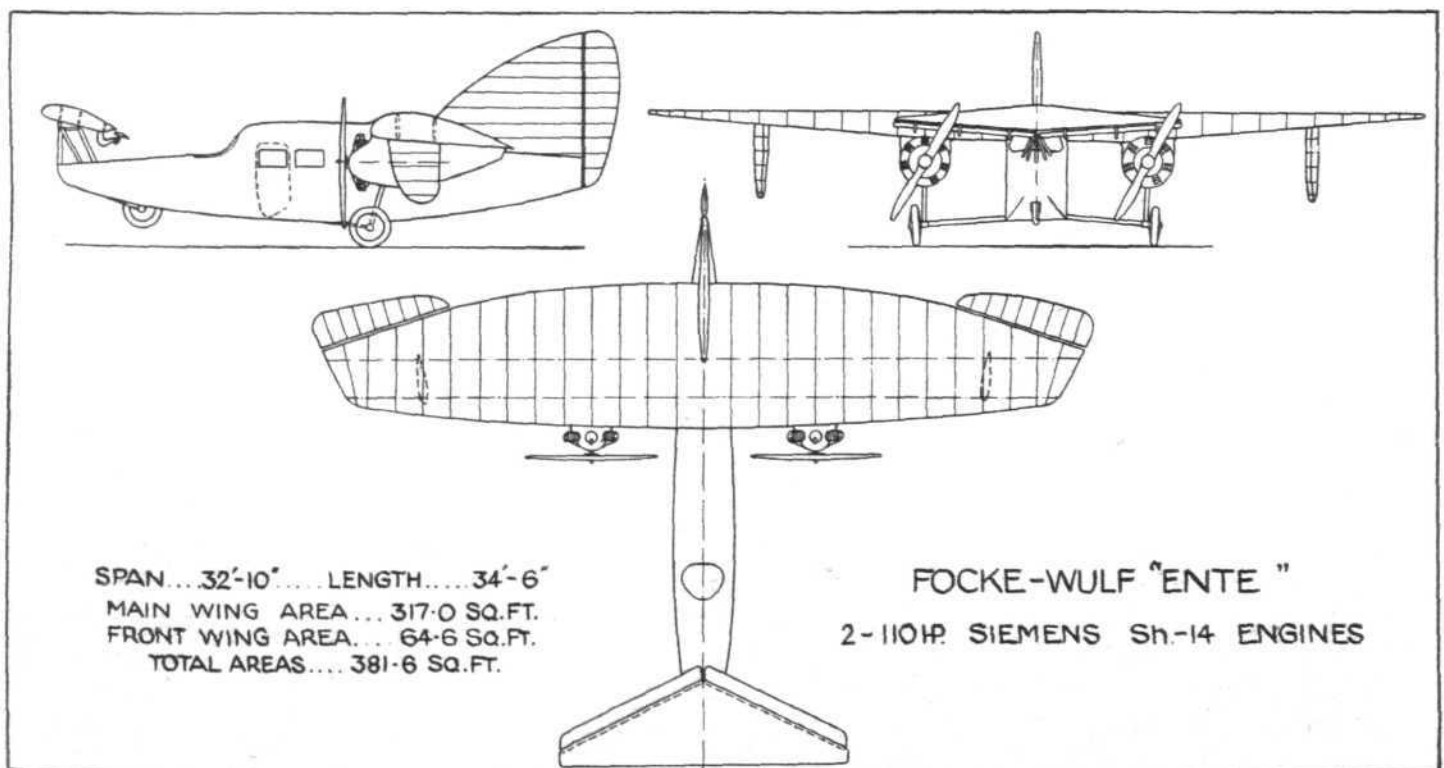
THE FOCKE-WULF "ENTE": Note the pilot's cockpit, the cabin door, and the petrol tanks in the wing. Standing by the machine are Herr Focke and the firm's chief test pilot, Herr Edzard.

something of a sensation. The internationally well-known scientists of this institute, funds of which are anything but abundant, must have seen a very promising future for this type of plane, or they would not have dared to invest considerable sums in its development. In fact, the plans met with the whole-hearted support, not only of this institute, but also of several technical colleges; for instance, at Goettingen, where the responsible men allowed the wind tunnel to be used for months on end, to the exclusion of all other important work, for investigations on the new canard plane. Also at Aachen (Aix-la-Chapelle) leading scientists offered and gave their full assistance.

This lengthy introduction, I feel, is justified, for there are exceedingly few aircraft engineers anywhere that have ever given the possibilities of the "canard" plane any thought. Before describing the new plane, which has put up a most creditable performance, it may, therefore, be

cause of accidents is entirely eliminated, especially if, as is the case with the present Focke-Wulf "Ente,"\* a type of main wing is used that anyhow positively precludes any possibility of a spin developing, as has been definitely and conclusively proven. Thirdly, in the event of the machine hitting an obstacle on the ground, the passengers are comparatively safe from injury as the long fore-part of the machine protects them. This is all the more the case if, as in the present Focke-Wulf "Ente," two engines are employed, which are located right and left of the fuselage under the main wing, for if these drop out of their mountings in a crash, they cannot crush the passengers. A peculiar advantage attaching to bi-motored "canard" planes is that some of the power lost by the formation of air eddies behind the front wing can be regained by letting the propellers in front of the main wing turn in the opposite

\* "Ente" is the German word for duck or, in French, "Canard."—Ed.



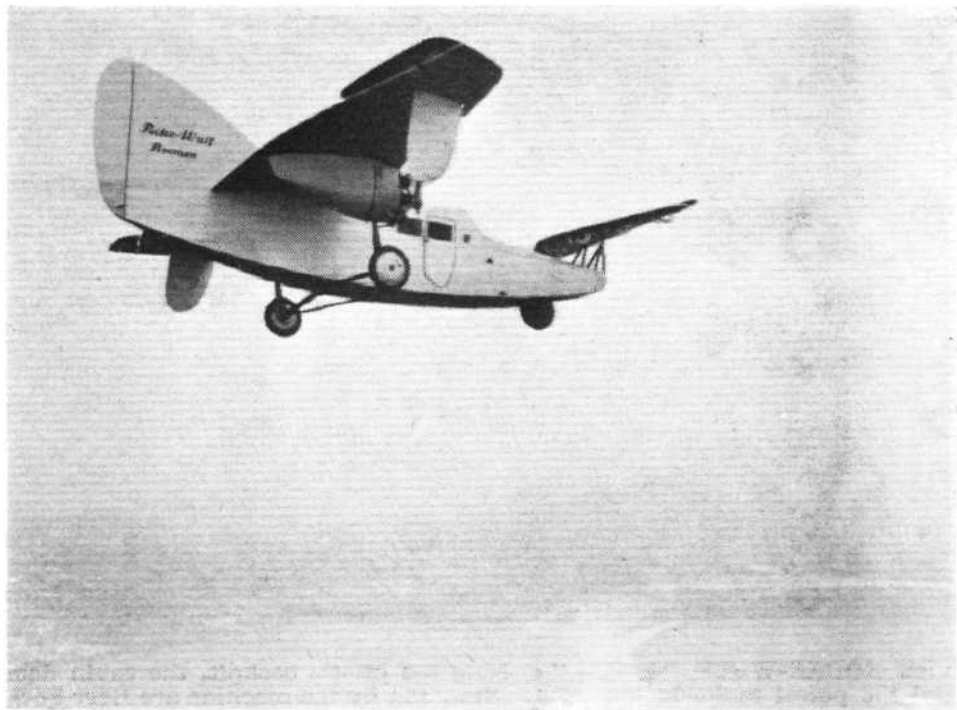
THE FOCKE-WULF "ENTE": General Arrangement Drawings. Note the peculiar plan form of the front plane.



direction to the vortices of these eddies. The propeller blast will then become practically straight. By fitting the propellers behind the main wing, their blasts go straight out into the air without touching any part of the plane. This arrangement has not been adopted in the present plane, as the makers did not consider the connecting shaft problem between engine and propeller sufficiently cleared up, and they did not want to enter into any new experiments.

All these are advantages worth considering, and they make it intelligible why the German Aeronautical Research Institute attaches such importance to the new type of plane. It will be recollected that the first Focke-Wulf canard plane was completed in 1927 and that several successful flights, in fact 14, were accomplished with it, before, on September 29 of that year, Herr Wulf, the associate of Hinrich Focke, crashed with the plane and lost his life. This accident, it must be pointed out, was discovered to be no result of any flaw in the "canard" principle, but was traced to a special kind of control of the front wing, which has now been dropped, and to which reference will be made later.

The new Focke-Wulf "Ente" has a total length of 34.5 ft., and the lower surface of the fuselage is square with a slight curve in the longitudinal direction making the ends come upwards. It is built up of welded steel tubes covered with fabric, and the main wing, which is of the peculiar Focke-Wulf type and has the ailerons in the normal position, is built up of wood, likewise fabric covered. It has a span of 33 ft. and a lifting surface of 317.5 sq. ft. It lies on top of the fuselage and is secured there in a recess, its leading edge being about 12 ft. away from the rear end of the fuselage. Left and right of the latter, fitted immediately under the wing, are engine nacelles carrying at their forward end each one Siemens & Halske radial engine of 100 h.p. output. Behind the engines, inside the nacelles, are fireproof bulkheads, and again behind these are the upper ends and the rubber ring shock absorbers of the telescopic legs. The wheels beneath the main wing are supported on divided axles. The engine nacelles also carry



**"TAIL FIRST" :** In this view of the Focke-Wulf "Ente" in flight can be seen the undercarriage, the outboard fins, and the very large fin and rudder.

the oil tanks, whilst the fuel tanks are located in the wing nose, right and left of the fuselage.

Immediately in front of the leading edge of the main wing begins the three-place passenger cabin, entered by a door on the right side. In front of the passenger cabin the top of the fuselage sweeps down embracing at this point the pilot's open cockpit. In front the fuselage ends in a blunt point, above which it carries trestle struts, which support the front wing.

The latter has a span of 16.4 ft. and a lifting surface of 64.6 ft. It is trapezoidal, or almost triangular in shape, with a straight and long leading edge. The trailing edges meet at an obtuse angle, and their under surfaces are recessed for the elevators. These are compensated and supported by a number of brackets holding them so that there is a slot between them and the wing, which slot becomes narrower when the elevators are depressed for climbing, and larger



**THE FOCKE-WULF "ENTE" :** Two views of the front plane. Note the slot arrangement of the elevator flaps.

when they are raised for going down. The trailing edges of the elevators are formed by a strip of aluminium,  $\frac{1}{8}$ -in. in thickness, and standing out rearwards for approximately 1 in. In the earlier model, which, as previously mentioned, crashed in 1927, the front wing was so mounted that it could be moved see-saw fashion on its support, from the pilot's cockpit. This arrangement was adopted, as it was hoped to counteract, by moving it one way or the other, the effects of one of the engines ceasing to work in mid air. Now, however, the wing is held in a horizontal position by double cables at each side, while horizontal stresses are, to a certain extent, taken up by the wing tips being connected by cables with the tips of the main wing. Underneath the front wing, recessed in the fuselage, is a third wheel.

Owing to the turning point of the 'plane lying so far back in front of the main wing, it was necessary to provide a very large rudder fin, to which is then attached a narrow and high rudder. There appear to have been difficulties to ensure the 'plane keeping on its course, for in addition to the rudder fin, two further fins, of relatively large size, have been provided, one each side left and right underneath the main wing, about half way between the engine nacelles and the wing tips. These vertical fins are supported on both sides by cables, and they are set at a slight angle to the axis of the fuselage in such a manner that, if their 'planes were to be prolonged in a forward direction, they would meet some distance in front of the 'plane. All controls are operated by wire cables running over pulleys.

The weight of the complete 'plane, including the passenger appointments, is 2,585 lb., and it is capable of transporting a load of 1,045 lb., making a total flying weight of 3,630 lb. The maximum speed attainable is 88.5 m.p.h., whilst the cruising speed is 79 m.p.h., and the landing speed 51.5 m.p.h. The 'plane climbs to 1,000 m. (3,280 ft.) within  $8\frac{1}{2}$  min. These performances are not very exceptional but in a 'plane so young of development, they must be regarded as very good. As a matter of fact, most of the development has been done in the wind tunnel and in the drawing office, and the makers were pleasantly surprised to find the machine behaving so excellently as already to admit of its introduction in the passenger transport business. The writer has enjoyed a ride in the machine, and was struck with the relative noiselessness in the cabin and the fine manoeuvrability in the air. The makers say that they have gained so much experience in



One of the Power Plants of the "Ente": These are Siemens Sh-14 type, of 110 h.p. each. The under-carriage consists of a horizontal Vee and a telescopic strut to the engine mounting.

constructing this 'plane that they now feel capable of building any size "Ente" 'plane from a small sporting to the largest transport 'plane.

## SOME COMMENTS ON THE FOCKE-WULF "ENTE"

WHEN trying to form an opinion of the merits or otherwise of the Focke-Wulf "Ente," one should bear in mind that, although it has now been approved by the German authorities for passenger-carrying, the machine is to be regarded as an experimental type, and it is to be assumed that improvements can be made in later machines. This supposition is necessary in order not to be unfair by being too critical, as one might well otherwise be. The designers do not claim for the "Ente" type either better aerodynamic efficiency or more economical structure weight. What they do claim is a number of advantages not possessed by the orthodox type of aircraft, such as impossibility of stalling and consequent spinning, and virtual impossibility of turning over on the ground, even when landing on very rough ground, or with the wheels locked by the brakes. Both these claims would appear to be supported not only by theory but by the very thorough flying tests carried out before the machine was approved for passenger-carrying. Thus the points in favour of the "tail-first" type of aircraft may be summed up briefly as follows: It will not stall, in the sense that its main lifting surface cannot, by any manoeuvre possible to the pilot, be made to exceed its maximum lifting angle. It will not spin, because before this is possible the main wing must reach stalling angle, which it never does. It cannot turn over on the ground. This is, of course, an obvious result of the length of fuselage projecting ahead of the centre of gravity and of the wheels. One point upon which we have no data is the loss of height incurred when the front lifting surface is stalled and the nose drops. A certain loss of height there must, presumably, be, but it would seem likely to be a good deal smaller than that which would result from a stalling of the main lifting surface. Apart from the actual loss of height, the worst case would, one presumes, be that in which the front lifting surface was stalled at such a height above the ground that the machine struck while at its steepest angle, i.e., just as the nose had dropped, and before it had had time to rise again as a result of increased speed gained in the dive. Much seems to depend upon that angle. If it is very great, serious damage might result from striking the ground. If the angle is not

very great, or in other words, if the nose does not, at the maximum angle attained, point downward very steeply, then it seems likely that, even in this worst case, the machine might simply glide on to the ground without damaging itself.

Turning to the other side of the balance sheet, it is not at all difficult to find room for criticism. For example, an examination of the figures reveals the fact that the ratio of gross weight to tare weight is only 1.405, a figure which can only be described as poor. A ratio of gross to tare weight of 1.6 or more is reached in most British aircraft, and that with loadings (wing and power) lower than those of the Focke-Wulf "Ente." One British machine which is comparable with the "Ente" in that it is of approximately the same weight, power and wing area, is the Saro "Cutty Sark." This machine, as our readers will know, is a flying-boat, also produced as an amphibian. In its plain flying-boat form the Saro "Cutty Sark" weighs fully loaded 3,700 lb., and the tare weight is 2,425 lb., giving a ratio of 1.522 as compared with 1.405 for the "Ente." The difference in gross weight is but 70 lb., but the difference in tare weight is 160 lb., both figures being in favour of the "Cutty Sark." The wing areas of the two machines are approximately equal, and the engines are also of approximately the same power.

On the subject of aerodynamic efficiency, the "Ente" cannot be described otherwise than as disappointing. With a wing loading of 9.77 lb./sq. ft. and a power loading of 16.5 lb./h.p., the maximum speed given is only 88 m.p.h. With approximately similar loadings, the Saro "Cutty Sark" has a maximum speed of 105 m.p.h. It is a little difficult to account for this disappointing performance. The Everling "High-Speed Figure" is only 8.04 which is extremely low. The corresponding figure for the "Cutty Sark" is 11. Thus, assuming equal propeller efficiency, the minimum drag coefficient of the "Ente" is 1.375 times as great as that of the "Cutty Sark." There is no very obvious explanation of this. The "Ente" looks fairly "clean," although the "whiskers," in the form of large clumsy cranks, on the forward plane might produce a certain amount of unnecessary drag, as probably does also the fuselage flying "wrong end on."



# THE PRUDDEN-WHITEHEAD MONOPLANE

## An American All-Metal Commercial Machine

**W**E give this week some brief non-technical details of a recent all-metal monoplane produced by the Atlanta Aircraft Corporation, of Atlanta, U.S.A.—namely, the Prudden-Whitehead commercial monoplane, the design of which was recently approved by the U.S. Department of Commerce.

The Prudden-Whitehead all-metal monoplane embodies several novel features, and while the unusual features to be noted can in no way be considered radical, it is their efficient application and execution of design that has produced very favourable impressions during its demonstrations in the eastern States of America.

This machine is all-metal throughout, of duralumin and duralumin alclad, and is of the low-wing type. The fuselage is one of the very rare, full monocoque types, the bulkheads being formed from sheet duralumin over which the corrugated alclad "skin" is laid.

The monoplane wing is of full cantilever construction, carrying three main spars of duralumin, with alclad covering. It is to be noted that the corrugated metal wing covering carries a portion of the stresses. Ailerons are inset, and the tail-surfaces conventional with balanced rudder.

Possibly the most notable of the novel features is the installation of the engine mount nacelles in the leading edge of the wing, carrying a modified N.A.C.A. cowling with collector ring in the leading edge.

The landing gear is of conventional split type, with an Aerol shock strut installation on the main wheels and oil-draulic strut at the tail wheel, Bendix brakes, with high-pressure tyres are standard equipment.

In the appointments of the passenger cabin, every consideration has been given the comfort and safety of passengers. Colours are soft browns and green, pleasingly blended. Ventilation is furnished by specially-constructed adjustable ventilators at each seat, the plate glass windows being fixed. The pilot's cockpit windows carry shatterproof glass, two of which are movable. A remarkably broad range of visibility is to be had not only from the pilot's seat, but from the cabin as well. Seats are comfortably upholstered in soft chrome leather. Attention to detail is shown in the equipment of a wash room and toilet.

Everywhere attention to details which may promote safety has been given, in both the design and in construction as well. Power is furnished by three Wright J6-R760 motors, and the installation is so made that no factor can affect more than one motor at one time. Fuel, baggage compartment, and all weighty constructions are placed below the passenger

cabin. Mail contractors have evidenced interest in the considerable load space, available without the use of the passenger compartment for this purpose.

The following is the P.M. monoplane specification of this machine :—

### General Dimensions

|                |               |
|----------------|---------------|
| Span overall   | 66 ft. 6 in.  |
| Length overall | 44 " 10 "     |
| Height         | 14 " 7/8 "    |
| Wing area      | 662.5 sq. ft. |
| Wheel tread    | 18 ft.        |

### Cabin Accommodation

|                         |             |
|-------------------------|-------------|
| Width                   | 5 ft. 0 in. |
| Aisle width             | 1 " 3 "     |
| Seat width              | 1 " 6 "     |
| Length, passenger cabin | 10 " 0 "    |
| Height                  | 6 " 10 "    |
| Height (average)        | 5 " 5 "     |
| Seats                   | 8 to 10 "   |

### Performance

|  |                      |
|--|----------------------|
| High speed                               | 145 m.p.h.           |
| Cruising speed                           | 124 "                |
| Landing speed                            | 55 "                 |
| Take-off (with full load)                | 7 seconds.           |
| Take-off run                             | 384 ft.              |
| Climb, at sea level                      | 1,220 ft. per min.   |
| Absolute ceiling                         | 17,000 ft.           |
| Service ceiling                          | 15,000 "             |
| Altitude maintained with 2 motors        | 10,000 "             |
| Net weight                               | 5,200 lb.            |
| Useful load                              | 2,535 "              |
| Gross weight                             | 7,735 "              |
| Pay load                                 | 1,330 "              |
| Power plant (3 Wright J6-R760, 240 h.p.) | 720 h.p.             |
| Wing loading                             | 12.25 lb. per sq.ft. |
| Power loading, 3 motors                  | 10.75 lb. per h.p.   |
| Power loading, 2 motors                  | 16.1 " "             |
| Gliding ratio                            | 9.5 to 1             |
| Fuel capacity                            | 150 gals.            |
| Fuel consumption per hour                | 30 "                 |
| Oil consumption per hour                 | 1.37 "               |
| Miles per gallon fuel at cruising speed  | 4.12.                |
| Endurance                                | 5 hours              |
| Range                                    | 620 miles            |



**AN AMERICAN ALL-METAL COMMERCIAL MONOPLANE:** The Prudden-Whitehead low-wing monoplane, powered with three 240-h.p. Wright J6-R760 engines, and carrying eight passengers.



Cleanness of design and workmanship, the effectiveness of the cowlings, and streamlining, have effected an efficiency which is responsible for very good performance characteristics of this machine.

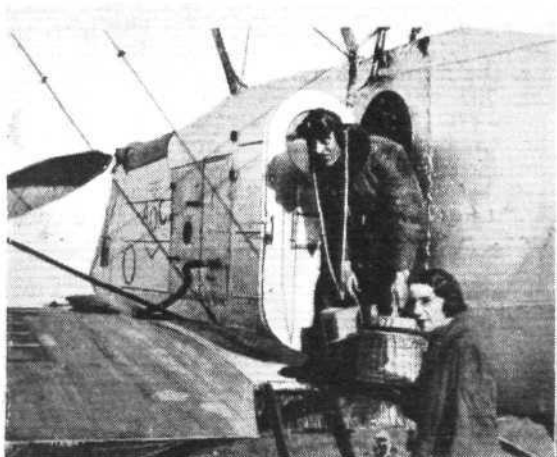
The plane now produced is an eight-place job, designed for transport use, but the makers point out the fact that the design is elastic and may be applied to larger or smaller construction without material loss of efficiency.

The designer, Mr. George H. Prudden, has long been identified with the development of all-metal multi-motored aircraft, and to him has been accredited much of the advancement in

that branch of the industry, having formerly been associated with Mr. William B. Stout during the development of the Stout metal aircraft. He may well be pleased with his latest accomplishment.

The sales activities of the company are under the direction of Mr. Edward Whitehead, who was formerly connected with a General Electric merchandising organization, and also headed a larger real estate development on the Pacific coast. Mr. Whitehead served with credit throughout the late world war, seeing active service on both the western and Italian fronts with the air forces.

## "SNAPSHOTS FROM SOUTH AFRICA"

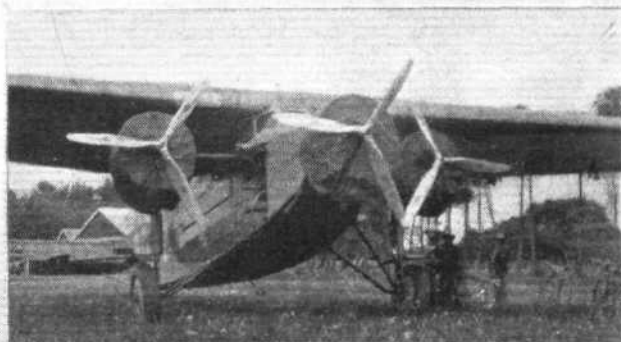
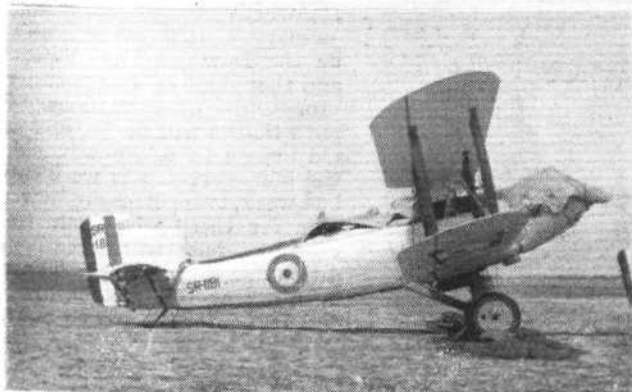
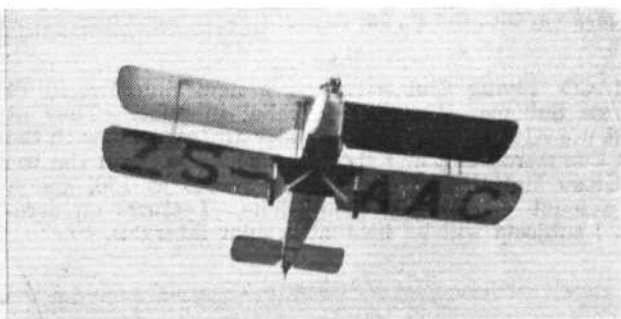


A SOUTH AFRICAN reader of FLIGHT, Mr. G. M. Sargeant, Jun., has sent us the accompanying snapshots depicting a few aviation events happening in that part of the world during the past few years, which, we think may be of interest. The first shows Mr. and Mrs. A. S. Butler deplaning from their Gloster "Survey" machine at Wynbird Aerodrome, Cape Town, on their arrival there last April. The Gloster AS.31 machine, G-AADO, fitted with two Bristol "Jupiter" engines, it will be remembered, was flown out

Universal" monoplane (Pratt & Whitney "Wasp" engine), used on the Union Airways Cape Town-Johannesburg air mail service.

Below this picture (centre, right) is the Cape Town Flying Club's first Avro "Avian," which was presented to them by the "Shell" Co. Our reader writes that this club has had to close down as it was unable to pay its way without a Government subsidy.

Next, bottom left, we have one of the Fairey "III F"



from England by Mr. and Mrs. Butler for the important survey work which the Aircraft Operating Co. had undertaken to carry out in Rhodesia. This machine is also shown, in the second snap on the left, about to leave Cape Town for the scene of operations.

The top right-hand picture shows the Fokker "Super-

(Napier "Lion") bombers of the R.A.F. Cairo-Cape flight (1929), at Cape Town. This actual machine crashed on the return flight.

The last picture is the late Mr. Van Lear Black's Fokker F.VII.3m., G-AADZ, snapped at Cape Town when he flew there in 1929.



# PRIVATE FLYING AND CLUB NEWS



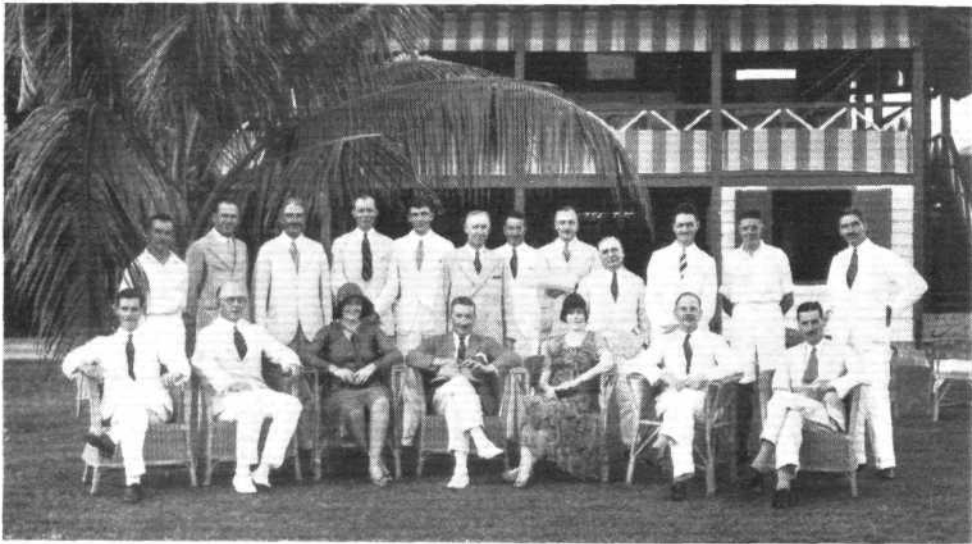
**FLYING in India.**—The following table shows the increasing amount of club flying which is being done in India.

*Flying Hours, October, 1930*

|                          | Bengal  | Bombay  | Delhi  | Karachi | Punjab  | Madras | Total   |
|--------------------------|---------|---------|--------|---------|---------|--------|---------|
| Instructional Flying ... | 60.45   | 13.25   | 14.30  | 28.35   | 71.05   | 22.05  | 210.25  |
| Soloists ...             | 37.15   | 2.25    | 71.20  | 86.05   | 69.35   | 2.25   | 269.05  |
| Joy Rides ...            | 3.25    | ...     | 6.45   | ...     | 6.40    | 3.25   | 20.15   |
| Tests ...                | 10.00   | 2.40    | 2.10   | 11.50   | 10.15   | 2.00   | 38.55   |
| Other Flying             | 84.30   | 22.20   | ...    | ...     | 11.10   | 0.40   | 118.40  |
| Previous Months 1930     | 195.55  | 40.50   | 94.45  | 126.30  | 168.45  | 30.35  | 657.20  |
| Total ...                | 1232.15 | 1230.00 | 937.01 | 1181.20 | 416.50  | 207.20 | 5204.46 |
| * Sept. and Oct.         |         |         |        |         |         |        |         |
| Europeans                |         |         |        |         |         |        |         |
|                          | Dual    | Solo    |        |         | Dual    | Solo   |         |
| Previous Months 1930     | 88.55   | 154.00  |        |         | 114.10  | 121.05 |         |
|                          | 1027.47 | 1084.06 |        |         | 1476.53 | 853.21 |         |
| Indians                  |         |         |        |         |         |        |         |
|                          |         |         |        |         |         |        |         |
|                          | 1116.42 | 1238.06 |        |         | 1591.03 | 974.26 |         |
|                          | 2354.48 |         |        |         | 2565.29 |        |         |

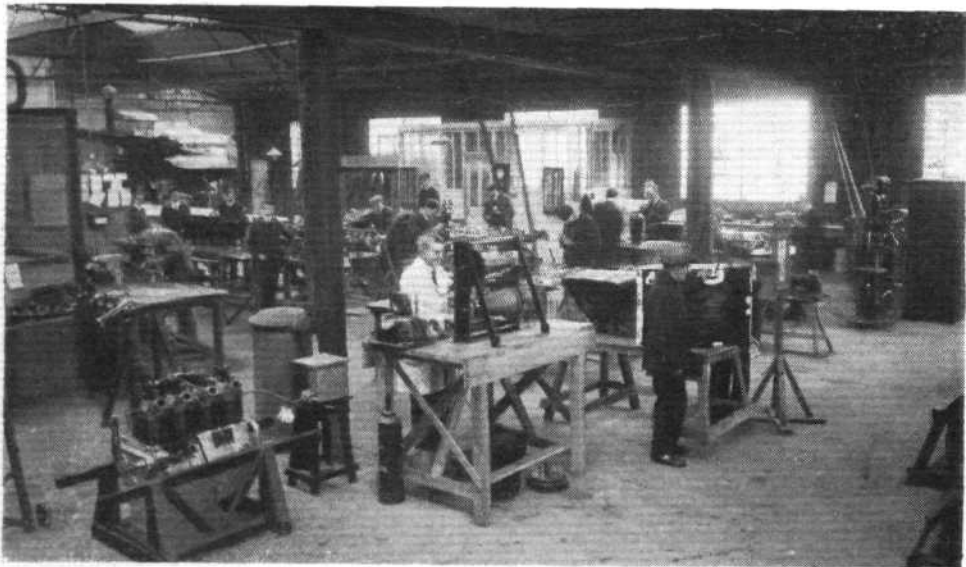
**Air Marshal Sir Geoffrey Salmond, Air Officer Commanding R.A.F., India, with members of the Singapore Flying Club on the occasion of his recent flight from India to Singapore.**

**Names — Standing, left to right:** Messrs. Harvey, (ground engineer), Morgan, Col. Turner, R.E., Fl.-Lt. J. F. Titmas, R.A.F. (Club captain), Dr. Stanley, (hon. secretary), London (Wing Commodore), Gardner (vice-captain), Walker, Niblock, Pestill, Fl.-Lt. S. H. Potter, (instructor), Cairns. **Seated, left to right:** Mr. Watts, Hon. Mr. M. B. Shelley, acting Colonial Secretary, Mrs. Pestill, Air Marshal Sir Geoffrey Salmond, Mrs. Titmas, Mr. Trimmer, Group Capt. A. H. Jackson, O.C. R.A.F., Far East.



**SUBIACO Flying Club.**—This is a new club formed at West Subiaco, Western Australia, in June. They at present use Klemm monoplanes, under arrangement with the Aerial Commerce Co., and shortly expect to obtain the use of a Gipsy Moth. The membership stands at 156, and a large amount of flying is being done. Lectures on aeronautical subjects will be held at regular intervals.

allowed them the use of his Gipsy Moth and Puss Moth. During the year, several successful functions were held at the aerodrome, which was also the last turning point for the King's Cup race, and on September 6, the private aerodrome of Mr. Lindsay Everard, at Ratcliffe, was opened, when some 150 visiting aircraft attended, as well as over 10,000 spectators.



**HANWORTH CLUB.**—A children's party will be held at Hanworth Club on Wednesday, January 7, 1931. The hostess will be the Dowager Lady Swaythling, and there will be a large and varied programme of attractions. Children's tickets will be 5s., and adults' tea tickets 1s. 6d., obtainable from the manageress. As we mentioned last week, two ponies are now available for those who wish to take riding exercise when weather conditions prohibit flying. These may be hired at 10s. for the first hour, and 7s. 6d. for the second hour.

**A view of the well-fitted engine workshops at Hanworth Park.**  
(Flight Photo.)





# GLIDING



**GLIDING at Hanworth.**—A glider has now been loaned to Hanworth Club, and it is hoped to experiment with towed flights behind a motor car, at such times when ordinary flying is not possible. Members who are interested in this innovation should get in touch with Flt.-Lt. H. M. Schofield at the club.

**COMRIE** Gliding Club's glider has been delivered, and the preliminary flights recently carried out were entirely successful. In spite of the fact that there was a strong cross wind blowing, and that the pilots had but little experience in flying, everything went off smoothly.

**GLASGOW** Gliding Club Ltd.—A company has been formed to extend the activities of the Glasgow Gliding Club. Known as the Glasgow Gliding Club (Ltd), 161, North Street, Glasgow, it is among the joint-stock companies which have been registered in Scotland this week.

The company is limited by guarantee, and has no share capital.

**GLIDING in America.**—An interesting little magazine, which gives its readers a lot of practical information about gliders and model aircraft, and enables one to form an opinion of the state of gliding in that country, is *The National Power Glider*, published by Dime Publications Inc., New York.

**THE ASSOCIATION of Northern Gliding Clubs.**—On Sunday, December 14, the first open-air meeting took place at the Aircraft Club's Harrogate ground. Representatives from Malton, Bradford, Harrogate and Leeds Clubs were present, and the Harrogate and Bradford machines were kept very busy. Many flights, varying from 15 to 30 seconds, were made, eventually the Harrogate machine was flown into the ground and knocked a wing off.

A member of the Bradford Club distinguished himself by flying direct into a 15-foot holly bush without damaging himself or the machine.

On Saturday, 20th, the official meeting of the A.N.G.C. took place, but the proceedings were of a private nature.

On Sunday, 21st, another open-air meeting took place at the Harrogate Club ground, most of the flying being done by the Bradford machine. The Leeds machine arrived rather late, while the Harrogate machine turned up later still and was put away in its shed as it was not thought worth while to erect it with only two hours of daylight; repairs had delayed its arrival.

During part of the day a steady breeze was blowing, which enabled many flights of between 30 and 45 seconds to be made.

**KENT** Gliding Club.—On Friday, December 26, a party of club members visited the R.A.F. station at Eastchurch. Although the weather was of the worst, the party had a very enjoyable and instructive morning, inspecting the various types of service aircraft in the hangars. Flight-Lieut. Crawford and Graham Nichols kindly explained the various details and conducted the party through the Gunnery School and Museum. After an excellent lunch at the Manor House Hotel, members returned to the aerodrome, and the rain having ceased some experiments in auto towing were carried out, however the ground was too saturated for the car wheels to get a trip, and attempts had to be given up.

On Sunday, December 28, a successful meeting was held at Lenham, but towards the end of the afternoon some slight damage was done to the tail plane, and further gliding was suspended.

January 4, 1931, is the first anniversary of the Club's formation, but as this date falls on a Sunday, the annual dinner is being held on Monday, February 23, the anniversary of the first gliding meeting.

tion, but as this date falls on a Sunday, the annual dinner is being held on Monday, February 23, the anniversary of the first gliding meeting.

**THE ISLE of Wight Gliding Club.**—For a number of past weeks the club has been meeting regularly at Somerton Aerodrome, and working very hard on flights from flat ground, practice in landings being chiefly concentrated on. Although work on "the flat" is devoid of any thrills and flights of any duration are impossible, the value of this "ground work" was very apparent on Sunday, December 21, when the club met at Whiteley Bank to commence instruction on slopes. A fairly strong north wind rendered the proper site unsuitable, but one was eventually found close by, and a number of members made very successful flights which were perfectly controlled throughout, and finished with good landings. No mishaps of any nature occurred, and at the close of the day the glider was returned to the hangar intact.

Now that the club has at last made a start on slopes, and in view of the very creditable flights made by members, it is anticipated that a bunch of "A's" will be applied for in the very near future.

New members are steadily being enrolled, but there is still plenty of room for others. Anyone interested is asked to communicate with the Hon. Secretary, 61, Swanmore Road, Ryde, I.W., who will be pleased to give all particulars relating to the club.

**SOUTHDOWN Skysailing Club.**—On Sunday, December 21, the club got through a lot of useful preliminary training on their ground near Ditchling Beacon. Some long-distance flights were made during the day by Flight-Lieut. Brown (club captain) and Messrs. Russell, Robins, Parker, and W. Wood.

A feature of the meeting was a splendid first performance put up by Miss Hackworth, daughter of Dr. Vivian Hackworth, the club's hon. medical officer (who also made a good glide the previous week). Miss Hackworth made two very straight and steady flights, earning the applause of the onlookers.

Another good effort by an *ab initio* was a steady glide made by Mr. D. M. Cannon, who should soon be ready to qualify for his "A" certificate. Messrs. Ely, Tulley, and King-Smith are also approaching certificate standard.

Altogether nearly 50 launches were made, and there was an increased attendance of interested spectators.

On Sunday, December 28, the Southdown Skysailing Club held their last practice meeting of the year, this being the ninth weekly meeting of the club. Well over 200 launches have been made and the R.F.D. primary training machine has stood up well to hard usage. With only two mishaps to record (and these were not really serious), a word of praise is due to the instructor, Flight-Lieut. Brown, D.F.C., and to his energetic team of ground engineers. In nine actual flying days very considerable progress has been made, and by next summer the club hopes to have trained a number of soaring pilots.

Owing to a very high and gusty wind blowing in the wrong direction on Sunday, at the club's gliding ground near Ditchling Beacon, training flights were somewhat restricted. Mr. C. G. Lawson, however, succeeded in making a faultless glide of 35 sec., thus qualifying for his "A" certificate—the fifth to be obtained by members in the last few weeks.

Other glides, varying in duration from 30 to 10 sec., were made by the following members: Flt.-Lt. Brown and Messrs. Robins, S. Wood, W. Wood, Cannon, Ely and Tulley.

For membership particulars apply: the Hon. Secretary, New Yorke Hotel, Bedford Square, Brighton.



## Royal Aeronautical Society Lectures

The following is the lecture programme for the second half of Session 1931, of the Royal Aeronautical Society. All meetings will take place at the Royal Society of Arts, 18, John Street, Adelphi, W.C.2, at 6.30 p.m.

1931.

Jan. 8 .. "Some Aspects of the Design and Construction of Sea-going Aircraft." Mr. A. Gouge, B.Sc., A.F.R.Ae.S.

Jan. 22 .. "Deck Flying." Sqdn.-Ldr. W. R. D. Acland, D.F.C., A.F.C.

Jan. 29 .. "Development and Construction of Sailplanes and Gliders." Herr A. Lippisch.

Feb. 12 .. "Air Navigation." Capt. N. Macmillan, M.C., A.F.C., A.F.R.Ae.S. (Joint meeting with the Guild of Air Pilots and Air Navigators).

Feb. 26 .. "Meteorological Aspects of Gliding and Soaring." Capt. F. Entwistle, B.Sc. (Joint meeting with the British Gliding Association).

Mar. 19 .. "Research in the Berlin Technische Hochschule." Dr. W. Hoff.

Apr. 16 .. "Aircraft Noise." Dr. A. H. Davis.

Apr. 30 .. "Aerodynamics of Sails." Dr. Manfred Curry.

May 14 .. "The Metal-Clad Airship." Mr. Carl Fritzsche.

## CORRESPONDENCE

[The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.]

### WHO WILL OBEY WHAT?

[2355] All concerned with the development of flying are busily repeating that flying is not dangerous now, whatever it may have been in the early experimental days. Now comes Daedalus saying that flying will be increasingly dangerous, however safe it has been in the early days of development. I take it that both are right. We have largely overcome the material dangers and we have now to fear the psychological ones. The aircraft had to be made safe in order to get people into the air. When they have got into the air they will rapidly make it unsafe for each other, unless . . . ?

It is really worth considering whether Daedalus is right or not, and if he is, whether his suggested remedy is not the happiest that can be devised, at all events for the near future. Consider for a moment recent experience. At the most popular air meetings there have been, on one or two occasions, as many as one hundred aircraft present. This fact alone called for special personnel, careful organisation and the whole-hearted co-operation of all concerned. It is fair to say that all participants rose to the special occasion. Familiarity, however, breeds contempt. In emergencies we willingly show a patience that in normal times do not always practise. The skilled drivers on the road, irritated at the ineptitude of the less experienced, engender situations with which the clumsy cannot cope. It is human, it is deadly and for some time it appears to have been inevitable.

The same characteristics will certainly reappear in flying. There are at present only four aerodromes to serve London. It will be disappointing if, in a short time, there is not an average of a hundred aircraft normally stationed at each of these aerodromes. If there were only a thousand aeroplanes at each aerodrome, flying could not be said to have developed very far: it would not even then be comparable to motoring.

The modest four hundred aircraft for London, then, already present a traffic problem, and on any route from London to anywhere, a very much sharper look out for other aircraft will have to be kept than is done habitually at present.

The behaviour of the pilots quoted by Daedalus is abnormal, but not by any means infrequent. Similar instances can be remembered easily enough by any pilot who has flown during the past year. If a few pilots continue to be reckless, the laws of chance are against their getting away with it. It is then that the trouble will begin for the others. There will follow an outcry against the dangers of flying, and we are a country that can be relied upon to take the pleasure out of anything about which we legislate. We hypocritically pretend that we are a flaccid, timid nation, worshipping safety first. In principle, a thrill is illegal, because it is dangerous.

Consider for a moment how new laws may come about. They may be made to still the squeals of the suburbs, growing like weeds, exclaiming their political consciousness by post-cards to their members. From similar sources sprang the 20 miles an hour speed limit. It must not be imagined that that law exhausted man's capability for making a fool of himself.

Urged from above, the Air Ministry will make recommendations after punctiliously seeking the counsels of the unelected elders of aviation. Round a table will be grouped the proud air force, despising its unlovely brother in a bowler hat and disdaining to compromise with commercial operators; the heads of representative bodies, risking their security only among the familiar dangers of the ground, reading from ill-digested papers, vicariously written; the sleek managers of the air ways elegantly aloof from the problems of the ruck; the bold adventurers of the trade, punctiliously dividing themselves into the humble, unsubsidised sheep and the grand state-aided goats, seeing in every regulation a cabining of their activities; conscientious, remote above this medley and fraught with loss of dignity to the higher civil servants, hover the technical advisers, voices crying in the wilderness. By such as these can be made the Kingdom of the Sky for us suffering little children.

We cannot discount the threat of international legislation, issuing from stifling halls of conference where men in ill-fitting clothes nurse black portfolios, their aching heads throbbing to the deadening repetition of interpreters. Who is in favour of the motion? Who against? And if the agreement, too often but a pale echo of the domineering voice of Paris, is unfit to be put into practice, it is still in the good old tradition.

I think we may be excused if we look elsewhere for a solution to our impending difficulties. Contrary to popular supposition, death is not a solution to all our difficulties. I am unable to state off hand how many people a day had to be killed for four years to make the world safe for democracy. It was either not enough, or too many. If we had to kill seven people a day for two years to make our roads safe for democracy, it is doubtful if our task is yet completed. It would be interesting, therefore, to try a new method in the new world of the air. Daedalus has suggested one and I think we should examine it.

He proposes that those who fly should draw up their own code of laws, appoint their own judges, and inflict their own penalties; that every pilot should represent justice and act as an informer against a fellow pilot guilty of breaking the law; that penalties inflicted should be paid voluntarily with no other sanction than that of popular opinion. Baldly stated, it sounds solemn and formidable enough, but its only real enemy seems to be solemnity.

There are precedents enough for such a game. I believe there is a parlour game called forfeits. I have been the victim of codes of rules in various messes in the Army. I have played, or attempted to play, as long as my faculties permitted, a game called "Here's a Health to Cardinal Puff." More pertinent still, there is, as Daedalus points out, the Stag Lane Rumble Club. All these have been successful. The British have a peculiar aptitude for this magnificent type of fooling. The spirit behind it should make the suggestion of Daedalus a practical one in this country, if nowhere else in the world. As in private flying, where we have led, others may follow, if they can.

The test of this idea is its popularity, without which it must fail. The first thing to do in seeking a solution to a problem is to find the question. I suggest that the question is, what is, or can be, the British Rumble Club?

As a practical step towards finding the answer, I propose to offer, through the courtesy of FLIGHT, a prize of two guineas to the person who shall submit the most ingenious reply. I shall ask the Editor of FLIGHT to appoint the judges, to announce the winner and, subject to editorial discretion, to publish the winning solution.

I would ask the judges to be influenced in their decisions by the following points:—The purposes of the British Rumble Club should be to induce pilots (a) to adhere to the rules of the Air Navigation Orders for the convenience and safety of themselves and of their fellow pilots; (b) consistently to refrain from flying in a manner likely to be offensive to ground folk; (c) invariably to extend to ground folk the same help and courtesy that so many ground folk have shown in the past to pilots.

These points were more humorously set out by Daedalus in his article, and I think that it is in the spirit of a Rumble Club that solemnity should be regarded as a necessary punishment inflicted by God upon the authorities.

The other points that I would put before the judges are that the replies should contain practical suggestions for the working of the club, the nature of the fines, the method of inflicting them, and what should ultimately be done with them. Finally, out of consideration for the judges, that the replies should be no longer than this article.

SANDY McTAVISH.

London, W.1.

December 29, 1930.

### A SUGGESTION

[2356] May I, through the medium of your Correspondence columns, put forward a suggestion of my own?

I have always been interested in aviation . . . and today this form of transport affects the general public more and more. When motoring through various parts of the country, or on foot, I have often observed an aircraft making a lone flight; often, to my own knowledge, a good distance from an aerodrome. I have also occasionally observed such aircraft getting into difficulties (though happily overcoming them). The following suggestion perhaps, then, may be found to be practicable.

Supposing such aircraft wished to make a forced landing and/or was in distress by day or night? Would it not be a good thing for both parties if the general public could be taught to recognise the distress signals as mentioned for the use of air-pilots in the Annex D section of the Convention



relating to the Regulation of Aerial Navigation? Of course, where the public is concerned the pilot could just use the international signal S O S (sound or visual), or by firing Very-lights (white) at short intervals. The point being that should any aircraft make such signals, the public in the vicinity would know what to expect: and could both get out of the way and stand by to assist afterwards. Or the pilot might intend to drop a message, there being no aerodrome near or A.A. patrol to pick it up. Especially would such recognition be useful in the event of a forced landing on ground that might, as viewed from the air, seem suitable, but there are occasions when those on the ground can detect hidden dangers, and by means of signalling back to the pilot intending to land, could thus prevent an accident, and even indicate a more suitable spot. If the general public does not know the recognised distress signals (various) as authorised by the aforesaid Convention, it is possible they might think the aircraft in question was merely undergoing signalling tests, etc., and instead of being able to help they might be the unwilling witnesses of one more air crash . . . perhaps of one more life added to the names of those who have made the Great Sacrifice, that fellow pilots may fly in greater safety.

MARY KNIGHTLEY

Golders Green, London, N.W.11.  
December 28, 1930.

### THE SYDNEY-BRISBANE RAIL SERVICE

[2357] As a Queenslander and reader of your journal, I would like to correct some statements you made in your Editorial Comment of November 28. You were referring to the success of the Australian National Airways service between Brisbane and Sydney as compared to that obtained between Sydney and Melbourne, and you attributed the success of the former service to the bad train service between those capitals. I quite agree. You miss the whole point of the argument however.

The train service between Brisbane and Sydney takes approximately 28 hours going via Wallangarra where the gauge changes from 3 ft. 6 in. to 4 ft. 8½ in., whereas that between Sydney and Melbourne takes about 15 hours via

Albury, where the gauge changes from 4 ft. 8½ in. to 5 ft. 3 in. A few months ago the 4 ft. 8½ in. gauge was opened from Kyogle to Brisbane I think. This will shorten the distance between the capitals approximately 100 miles and should considerably lessen the time, especially as it is not necessary to change trains at the border.

Furthermore, sleepers are provided on all long-distance trains in Queensland and I have found that there is very little to choose in comfort between them and those in use on the wider gauges of the southern states.

You can quite see from the above that it is the time factor and not so much the comfort which is responsible for the patronage business men have given to the Brisbane-Sydney air service. And you can take it from me that there is not so much comfort in an aeroplane when all one can see is the inside of a paper bag! Still that is an extreme example.

Stretford, Manchester,  
December 5, 1930.

T. E. COLLINS.

[2358] Permit me to point out an error in your most interesting paper. I refer to the Editorial Comment in FLIGHT, dated November 28, page 1380, column 2, line 14. Here it is stated, that no sleepers are provided on the Sydney-Brisbane mail train. I know quite definitely that sleepers are provided, and have been for the last 20 years. They are just as easy to procure on this line as they are on the Sydney-Melbourne one.

I have lived 24 years of my life in Australia, and travelled on both these lines many times.

As a matter of fact the Sydney-Brisbane line has recently been modified. The gauge is now uniform, and 6 hours' has been knocked off the journey.

G. E. SAMPSON.

Northolt,  
November 29, 1930.

[We are obliged to our correspondents for the correction. Our information was obtained from an Australian officer. We have heard from several sources that the railway journey between Sydney and Brisbane is very unpopular with travellers.—ED.]

## CROYDON WEEKLY NOTES

LAST week I had the opportunity of approaching Croydon purely from a passenger's point of view by flying to Holland on a machine of the Royal Dutch Air Lines, better known as the K.L.M. The uninitiated must have been very impressed by the efficiency of the service. We left the Hotel Victoria in a most comfortable motor coach, which I understand was designed specially for the K.L.M. by Capt. H. S. Leverton, their London Manager. There was a very thick pea-soup fog in Trafalgar Square, but at Croydon it was only misty. A slight delay in starting the flight was due to their making certain that weather conditions were good throughout the route.

The flight in the Fokker F VIII was extremely good, and we cruised throughout at 100 m.p.h. The cabin accommodation is as roomy and comfortable as it possibly could be, and compares very favourably with any passenger plane I have seen. So free from vibration was it that I could write throughout the journey without its having any apparent effect on my hand—an impossible thing to say of either train or road transport. But the most impressive feature of all from a passenger's viewpoint was something which almost enters into the everyday life of pilots. We flew in brilliant sunshine over a continuous sea of cloud without seeing a landmark. After some two and a-half hours, the engine noise faded out, and we went down through the cloud to find ourselves over the centre of Rotterdam. The courtesy and help of all the K.L.M. officials at London, Rotterdam and Amsterdam was remarkable, and the accommodation in the Aerodrome Hotel at Schiphol most comfortable.

The continuous fog right up to Christmas caused many services to be cancelled, and this, together with the closing down of all services on Christmas Day, has resulted in a drop of traffic figures this week to 206 passengers and 22 tons of freight. This is a great pity, for bookings had been very heavy, and in one morning the Air Union had to turn away three complete machine loads of passengers on account of adverse weather.

Mention was made a fortnight ago of the extremely heavy Indian Mail outward bound. The inward mail has been even heavier, and represented about 76,000 letters, weighing a full ton.

The work of lighting the Indian routes is progressing well in the hands of the Air Ministry, and similar work is going on throughout the Cairo-Cape Line. Here it is being done by the different Governments along the route. But all are using the experience gained at Croydon with flood and beacon lighting. Some of the mountain spurs in Africa will have permanent beacons to warn airmen against their dangers. The building and equipment of hangars, hotels and so forth at the African aerodromes has been almost completed by Imperial Airways. The opening date is still uncertain, but is likely to be very soon. This service is sure to appeal to the big diamond and gold interests of South Africa, and heavy cargoes of bullion may be expected. The questions of insurance are extremely difficult and intricate. But the saving in time of eleven days against the fastest steamer service of seventeen days, will give a great increase in the earning power of the bullion.

Mr. Holman of Cirrus Aero Engines, Ltd., is exceedingly cheerful, and appears to think that the new year will be both busy and prosperous for his firm. Orders for "Hermes" II engines continue to roll in, and now a demand for more has come from Sweden. This continued revival in Cirrus engines is good news for Croydon.

At the end of November a Tri-Motor Ford "5 AT" came to Croydon, and it was mentioned in these "Notes" as being luxuriously fitted out to meet the requirements of a wealthy private owner. It went to Paris at the time of the Aero Show, and has there been sold to the Earl of Lovelace, who was flying out to Tanganyika for big game hunting. With Mr. C. D. Barnard as pilot, he left Le Bourget on December 28 in his new purchase.

A notice has appeared on the wall of the pilots' room of the Aerodrome Hotel, announcing the formation of an Aerodrome Island Club. The qualifications for membership are that the applicant must have struck an island or refuge head on between the front wheels of his motor-car at a speed of over 10 m.p.h. The objects of the club are to get a reduction on the retail price for quantities of islands, to petition for the erection of rubber lamp posts, and to form a hospital visiting committee. The President is Capt. Horsey, the hon. secretary Capt. Bernard Wilson, and Capt. Willcockson is hon. treasurer.

M. L.



# AIR TRANSPORT

## THE BELLANCA "AIRBUS"

**I**N our issue for September 12, 1930, we published a photograph of what we called an unorthodox machine—the Bellanca Sesquiplane—and this week we give an illustration and some brief particulars of a recent development of this machine produced for commercial work by the Bellanca Aircraft Corp. of New Castle, Del., U.S.A.

The Bellanca "Airbus"—the machine in question—was designed to fill the apparent need for a transport 'plane which would enable air line operators to earn profits at fares comparable to the cost of rail transportation. It is a single-engined machine—hardly a monoplane nor yet a sesquiplane—suitable for passenger carrying and for combined mail and passenger work.

Carrying an unusually large payload behind a single motor of moderate horse-power, the "Airbus" has proved in an exhaustive series of flight tests to fill this need to perfection. It has a high speed of 147 miles per hour and cruises at 125 miles per hour at two-thirds full power. In take-off, climb and general all-around performance it compares very favourably with any of the heavy-duty transport machines on the market or known today. It accommodates 11 passengers with baggage and 500 to 1,000 lb. of mail.

As will be seen, the "Airbus" is what may be described as a high-wing monoplane with additional lifting surfaces formed by the landing gear and wing-bracing struts.

The design of the "Airbus" concentrates the load near the centre of gravity so that the stability of the machine is satisfactory under any of the widely varying load conditions between empty and full. The mail load, which may be anywhere from 500 to 1,000 lbs. according to the cruising range required by operators, is placed in pits in the lower stub (chassis strut) wings approximately directly on the centre of gravity. The passengers' baggage goes in compartments under the seats and well up forward, thus permitting the increasingly heavy loads of baggage met with in service to be handled without any sacrifice of stability and with increased safety. In the event of rough landings on unsuitable fields there is no unfixed weight behind the passengers that might shift forward on to them.

Probably the most unique feature of the "Airbus" is its wings. The upper wings are similar to that of a conventional braced wing monoplane, with the exception that each wing is divided into two panels. The inner or centre section panels of the upper wings, in conjunction with the lower stub wings, form the inner bay, being joined together by struts of round chrome molybdenum steel tubing faired with Balsa wood and braced by streamline wires similar to conventional bi-plane design. From the outer end of each stub wing another lifting surface called the auxiliary wing goes up to meet the outer panel of the upper wing, thus acting at the same time as a

bracing strut in addition to a lifting surface. These auxiliary wings taper both in plan and thickness from their widest part, where they join the stub wing to the rear spar of the upper wing.

The upper wings, both inner and outer bay, are built entirely of wood. The lower stub wings and auxiliary wings are built of chrome molybdenum steel, spars, ribs and compression members being welded solidly into one piece. The lower stub wings in particular fulfill a number of purposes. They act as lifting surfaces, form part of the landing gear structure, and, as mentioned above, also contain the waterproof metal-lined mail compartments, which have approximately 60 cubic feet of space.

The fuselage of the "Airbus" also is built throughout of chrome molybdenum steel tubing and is of conventional Bellanca design, being proof against weaving or twisting and calculated to withstand collapse in the event of a crash. The engine mount is hung on ball joints of very large size, which prevent the development of any wear or play. Being detachable, either a Curtiss Conqueror 600-h.p. water-cooled motor, a Wright Cyclone 575-h.p. air-cooled motor, or a Pratt and Whitney Hornet B 575-h.p. air-cooled motor may be installed. All are geared 2 to 1.

The landing gear of the "Airbus" represents a complete departure from conventional practice. The lower stub wings form part of the landing gear structure. The wheels go into recesses at the ends of these stub wings where the auxiliary wings join. Goodyear air wheels, size 37 by 16, are used. These are mounted on forks attached to the front part of these recesses in the stub wings and are easily removable by taking off one nut and withdrawing the wheel spindle. The wheels are further cushioned and kept in their proper position by oleo struts. An oleo strut is placed on each side of each wheel and these struts are attached about midway to beams running from front to rear of the landing gear recesses. The struts have a 3 in. travel and an additional cushioning movement of 8 in. is allowed by the wheels themselves. Being faired almost completely into the lower wing the drag of the landing gear as a separate unit, a serious consideration in other ships, is eliminated and the benefits of retractable wheels obtained without mechanism of any sort.

Plans have been made to make the "Airbus" available as either a landplane or a seaplane, and by a combination of wheel and pontoon gear, now under development, as an amphibian.

The control system is as simple as possible. All controls are operated by the usual steel cables running over ball-bearing micarta pulleys. The cables to the tail surfaces run down the centre of the cabin under the floor, and doors in the floor for the entire length of the cabin permit easy



**UNORTHODOXY—ONLY MORE SO:** The Bellanca "Airbus," a development of the sesquiplane illustrated in our issue of September 12, 1930. It carries 10 passengers, baggage and 500 lb. of mail at a cruising speed of 125 m.p.h. The engine is a Curtiss 600 h.p. "Conqueror."



inspection and replacement. All controls operate to their full movement without tightening or slackening of cables. The ailerons and elevators are operated by a throw-over wheel. The rudder pedals are of the automobile type, presenting a neat appearance and reducing the opening in the floor or fire wall to small round holes instead of slots. The brake pedals are on the left-hand side. The right-hand pedals are easily removable by taking out two bolts. A feature of the control system is that the control of each aileron is separately connected to the wheel, thus providing control of either aileron in the event of the other becoming inoperative.

The double pilots' cockpit is unusually roomy, with seats adjustable fore and aft by means of individual cranks. The cockpit may be entered through the cabin or through a full-sized door on either side. A window is provided in each of these doors, which can be raised or lowered by means of automobile-type cranks. Almost ideal visibility, both ahead and downward, is provided through the unusually large amount of window area. A sheet steel fire-wall separates the cockpit from the motor section. Heat for the cockpit is provided by means of a heater outlet under each pilot's seat.

The cabin interior of the "Airbus" is neat and comfortable. The passenger seats on each side of the cabin are on a platform 12 in. high. This leaves a sunken aisle down the middle, permitting a tall man to stand erect. The baggage is stored beneath the platforms on which these seats rest. The seats are deeply and comfortably upholstered over steel tube frames, and are provided with spring cushions. Individual adjustable ventilators and heater outlets are provided for each seat. Four individual seats are placed on each of the

longitudinal platforms, and two more passengers sit on a built-in automobile-type seat at the rear wall. A completely-equipped lavatory is entered through a door opening from the rear of the cabin by the side of this built-in seat.

In the air the "Airbus" is very stable laterally, longitudinally, and directionally. At the same time the general excellence of design permits instant manoeuvrability and adequate control surfaces provide complete control at speeds even below stalling.

The "Airbus" shows no spinning tendencies whatever, and is practically non-stalling. Recovery from any abnormal position in the air is automatic.

The principal characteristics of the Bellanca "Airbus" are:—

|   |  |
|---|--|
| Wing span ..                                  | 65 ft. 0 in.   |
| Wing area ..                                  | 651 sq. ft.  |
| Length overall ..                             | 40 ft. 8 in.   |
| Height ..                                     | 11 ft. 6½ in.  |
| Weight empty ..                               | 4,950 lb.  |
| Useful load ..                                | 4,000-4,500 lb., according to equipment and power plant.   |
| Payload ..                                    | 10 passengers and 250 lb. of baggage plus 500-1,000 lb. of mail, according to cruising range required by operator. |
| High speed ..                                 | 147 m.p.h.   |
| Cruising speed ( $\frac{2}{3}$ full power) .. | 125 m.p.h.   |
| Service ceiling ..                            | 18,000 ft.   |
| Climb ..                                      | 750 ft. per minute.  |
| Range with 200 galls.                         | 840 miles.   |

#### Cairo-Cape Town Air Service

THE Under-Secretary of State for Air, Mr. Montague, replying to a question in the House regarding the Cairo-Cape Town Air Service, stated that the negotiations had been completed and the agreement signed. The ground organisation was being developed with all possible speed, and it was expected that the northern section of the route, as far as Mwanza in Tanganyika territory, would be in operation at the end of February, and the through service to Cape Town as soon as possible thereafter.

#### French Air Service to the East

COMMENCING January 1, the French Compagnie Air Asie (Air-Orient) is operating an air service from Marseilles to Saigon, French Indo-China. The section as far as Karachi has already been in operation, and for the present, until final arrangements have been completed, the journey between Karachi and Calcutta will be made by train. From Calcutta, however, the service will be maintained by seaplanes. When in full operation the route followed will be—Marseilles, Rome, Corfu, Athens, Castlerosso, Beyrouth, Damascus, Baghdad,

Basra, Jask, Karachi, Jodhpur, Allahabad, Calcutta, Akyab, Rangoon, Bangkok, Saigon. Passengers travel by L car between Beyrouth and Damascus.

#### Spanish Air Services

As from January 1 the daily air services between Madrid, Seville, Barcelona and the Canary Islands will be resumed—the three lines having been closed down, or curtailed, since last October owing to lack of funds. The Canary Islands service will later be made twice weekly.

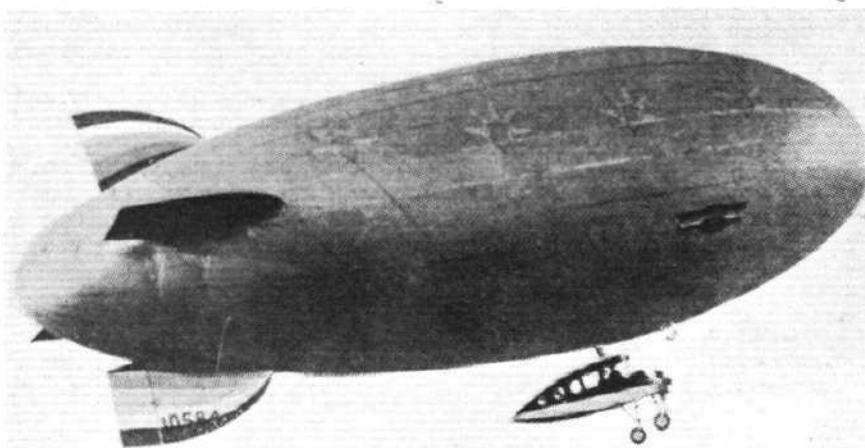
#### A New N.A.T. Passenger Service

AN air passenger service between Chicago and Kansas City will be inaugurated by National Air Transport to-day, January 2, and a few weeks later the service will be extended to Tulsa, Ft. Worth, and Dallas. Tri-motored Ford passenger and mail planes of a new type, which have a high speed of 152 miles an hour, will be flown by N.A.T. over the South-western route. These are the same type 'planes that are used by N.A.T. on its Chicago-New York passenger line, inaugurated December 1.



**DIESEL-ENGINE** : A Ford type 4-AT, fitted with three Packard Diesel engines of 225 b.h.p. each. With these engines the machine has a cruising speed of 100 m.p.h. It carries two pilots and 11 passengers.

# AIRISMS FROM THE FOUR WINDS



**AN AMERICAN "BLIMP":** A handy little non-rigid constructed, we believe, by the Goodyear-Zeppelin Corp.

## Italian Squadron's Cruise

THE twelve Savoia S.55 flying boats of the Italian Air Force (together with two repair machines), which are carrying out a formation cruise, under Gen. Balbo, from Italy to Brazil, left Kenitra (Morocco) for Villa Cisneros on December 23. One unit failed to take off, and had to be towed back into port, but the rest accomplished the 1,200-mile journey, thus completing the third stage of the flight. It was reported that the squadron completed the fourth stage to Bolama on Christmas day. They encountered a severe hail storm *en route*, as a result of which it is stated that new propellers were required. It is expected that the 12 machines will make the Atlantic crossing from Bolama on January 5.

## Lord Lovelace Flying to Tanganyika

LORD LOVELACE left Le Bourget for Tanganyika on December 28 in his new Ford Pullman aeroplane, piloted by Capt. C. D. Barnard. They reached Marseilles the same afternoon. Lord Lovelace, who has a farm some 300 miles south of Nairobi, also owns a D.H. "Puss Moth," which was supplied by Brian, Lewis, and C. D. Barnard, Ltd.

## The India-Africa Flights

MR. A. MURAD, of Bengal, left Calcutta on December 21, in a metal "Gipsy Moth," in an attempt to win the Aga Khan's £500 prize for the first Indian to fly from Karachi to Cape Town. He set out from Karachi on December 28.

On December 30 a second competitor started from Karachi;

this was Mr. Aspy Engineer (who took part in the first Aga Khan, England-India Prize) flying a D.H. "Puss Moth."

## Capt. Matthews Starts

CAPT. F. R. MATTHEWS, who, as reported in last week's issue, is to attempt a return flight from Australia in nine days left Sydney in his D.H. "Puss Moth" on December 27.

## Mrs. Victor Bruce Crashes

THE Hon. Mrs. Victor Bruce crashed in her Blackburn "Bluebird" at Medford last week while flying from Portland to San Francisco. Fortunately, she only received slight cuts and hoped to resume her journey to Los Angeles and Louisville (her mother's home town) after a few days' rest.

## U.S. Airship "Los Angeles" to Make Big Flight

THE U.S. rigid airship *Los Angeles* is being prepared for a 5,000-mile flight from Lakehurst to Panama and back. The airship will leave Lakehurst on or about February 2, and on arrival at Panama will be moored to the *Paloka*, the U.S. Navy oil tanker, which is equipped with a mooring mast.

The *Los Angeles* will take part in the war manoeuvres, which are being held to study the problem of the defence of the Panama Canal.

## The U.S. Navy Airship

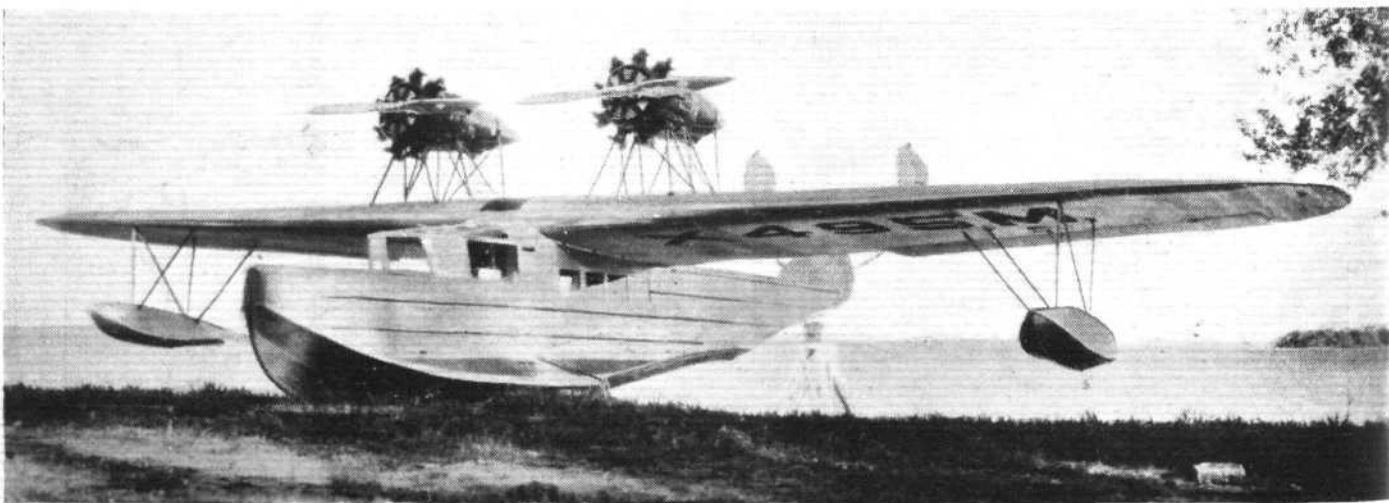
It is reported from America that the airship programme is being proceeded with in spite of the R 101 disaster. The 6,500,000 cu.ft. Navy airship ZRS 4 *Akron* will be ready for her fabric covering early this year, and is expected to make her trial flight in June. The eight German engines with which she will be fitted have been tested for the new arrangement of swivelling propellers, while the Navy Department are, it is said, working on heavy oil engines which may be developed in time for installation in the ZRS 5. Both airships will use helium gas.

## R 101 Memorial Fund

SUBSCRIPTIONS to the fund for a memorial to those who lost their lives in the R 101 disaster so far amount to £664. The fund is still open. Portions of the metalwork of R 101 have arrived by steamer at Liverpool, and will be conveyed to a Sheffield firm of metal merchants.

## Death of Herr Kober

THE death, shortly before Christmas, is reported of Herr Kober, a director of the Dornier Aircraft Works, who collaborated with the late Count Zeppelin in the construction of the first rigid airship.



**DIESEL-ENGINEED:** A Towle flying boat powered by two Packard Diesel engines of 225 b.h.p. each. The machine has a tare weight of 3,400 lb., and with a load consisting of 10 gallons of lubricating oil, 90 gallons of fuel oil for six hours, and 10 people at 170 lb. each, has a gross weight of 5,805 lb. The maximum level speed is 125 m.p.h., the cruising speed 100 m.p.h., and the sea level rate of climb 650 feet per minute.



# River Tenders for Air-Liners

To establish rapid communication with the shore, for mails and passengers, when the big flying boats of the England-Africa airway alight at various points along the river Nile, Imperial Airways have ordered a number of special power boats, luxuriously equipped, which are capable of a speed of 25 miles an hour. Seven of these river tenders, which are being supplied by the British Power Boat Company, of Hythe, near Southampton, will be stationed on the Nile. Each boat is engined with a 75-h.p. motor. A vessel of a similar type is being employed as a tender for flying boats at the Rochester seaplane works of Messrs. Short Brothers, where at the present time three very large marine-type aircraft, each driven by four engines developing a total of 2,000 h.p. are being completed for Imperial Airways for use on the Mediterranean Section of the airway to India and Africa.

## Imperial Airways

THE receipts of Imperial Airways in November last were £44,508, as compared with £38,879 last year, and the total receipts since the end of March were £445,469 against £440,909 for the corresponding period of last year. The miles flown in November were 73,986 against 82,933, and the total mileage since March was 943,683, as compared with 960,010. A record Christmas mail was carried on the India-England service on December 22, when the flying boat *City of Calcutta* arrived at Athens from Alexandria with a ton of mails—approximately 76,000 letters.

## Canadian Air Mail Contract

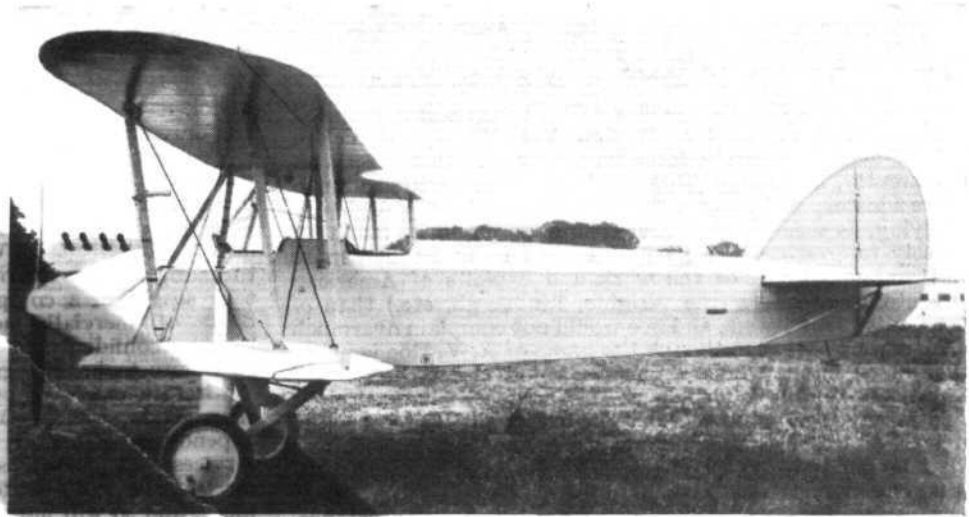
WESTERN CANADA AIRWAYS has just concluded a four year contract with the Canadian Post Office which, in conjunction with through connections with American airways, will result in a saving of 40 hours in the transmission of mails between Calgary, Alberta, and Toronto.

## France and the Schneider Trophy

It is reported that France has already selected three pilots for this year's Schneider Trophy contest. They are Capt. Amawinch, Lt. Denougeot and Lt. Bougault—who have already carried out trial flights off Bordeaux. Two machines have tentatively been selected, a Nieuport and a Bernard. Both France and Italy have sent in their official entries to the Royal Aero Club.

## A Russian Arctic Air Service?

SOME time this month the Russian pilot Boris Chukhovskiy and a large crew will leave Moscow in a Soviet-built ANT-9 machine on an expedition to the Arctic. He will follow a route up the Yenisey River (Siberia) to Point



THE "CIRRUS" IN JAPAN: The Ishikawajima training biplane, which, as mentioned in Croydon Notes recently, is now being fitted with "Hermes II" engines.

Dickson, Franz Josef Land, North Land, and other Arctic Ocean outposts.

The object of the expedition is that it is hoped eventually it will be possible to establish all-the-year-round communication with the growing number of Soviet trading posts. At present these outposts are cut off for most of the year by ice.

## D.H. Aeronautical Technical School Ball

THE students of the De Havilland Technical School are holding a Ball at the Portman Rooms on February 6—Reception at 8 p.m. and dancing from 8.30 p.m. to 2 a.m. Tickets may be obtained by all members of the Aircraft Industry from the hon. secretaries, Capt. A. T. Eadon and Mr. Upton, Stag Lane Aerodrome, Edgware, price 4s. single and 7s. 6d. double.

## British Aerodromes

IN reply to a question in the House on December 17, Mr. Montague, Under-Secretary of State for Air, said that at present there were 129 licensed civil aerodromes in Great Britain and Northern Ireland, and 50 R.A.F. aerodromes, making 179 in all.

## The Blackburn Contract in Greece

THE Greek Government has signed the contract with the Blackburn Aircraft Co. for exploiting the Phaleron Aircraft Factory. The contract is for seven years, but the Government retains the right to cancel it after five.

## Aircraft for Egyptian Air Force

FOR reasons of economy the Egyptian Government has decided to reduce the number of aircraft to be purchased to form the nucleus of an Air Force from ten to five.



DIESEL-ENGINES: This Verville "Air Coach" will, it is claimed, fly from Chicago to New York at 105 m.p.h. on four dollars' worth of the special fuel oil used. The maximum speed of the machine is 130 m.p.h. The Packard Diesel engine is rated at 225 b.h.p.

## BOOK REVIEWS

## FLYING BY AMERICANS AND SOME OTHERS.\*

MR. GOLDSTROM has flown all the stages of the United States air mail from New York to San Francisco and he learnt a lot about that magnificent service. Apparently, he thought that this experience entitled him to write a history of flying; so he proceeded to do so. A history of flying, as seen through American eyes, might be made intensely interesting. One might expect to find much more full accounts given of the work and exploits of American inventors and pilots (the Wrights, Lindbergh, etc.) than of the deeds of foreigners, and one would not complain overmuch that it were so—even though the name of A. V. Roe is never mentioned in the whole of this book. It is not that aspect of this book which forbids us to praise it. The selection and arrangement of matter is quite extraordinary, and shows a lack of balance and judgment in the author. The fact is that he is not really *au fait* with his subject, though he has studied some features of it with great care and has reproduced the results of his studies at considerable length. For instance, the story of the first flight by the two brothers Wright has been compiled and reproduced once more with much detail. Then a fairly long chapter is devoted to the dispute of Orville Wright with the Smithsonian Institute. The author is evidently strongly pro-Wright, but the chapter throws no new light on the true place of Professor Langley in the history of aeronautics. The collection of stories of great flights, those by Americans being recounted at much greater length than those by foreigners, has some interest; but after all, there is nothing commercial in flying the Atlantic or round the world, and this fact does not seem to have been grasped by the author. The two chapters on "European Air Transport" and "Other Foreign Countries" must have been compiled from reference books of the nature of Whitaker's Almanac. The notice given of Canada is particularly inadequate, for it says not a word about the wonderful work of the Royal Canadian Air Force in forest fire patrols and surveying.

In fact, Mr. Goldstrom really justifies his authorship only when writing about the United States Air Mail. For his account of that, readers in Great Britain should be really grateful. The air mail is a wonderful piece of work, and Mr. Goldstrom describes it very well. If he had confined his whole book to this subject he would have done far better. The best thing in the book is the crash report of an air mail pilot, Dean Smith. It ran:—"Dead-sticked—flying low—only place available—on cow—killed cow—wrecked 'plane—scared me—Smith."

F. A. DE V. R.

\* *A Narrative History of Aviation*. By John Goldstrom (Macmillan). Obtainable from FLIGHT office. Price 17s. net.

## A HISTORY OF FLYING.\*

Books on flying are now coming out in a perfect stream, which shows that the publishers now recognise the importance and general interest of the subject. This is a very gratifying sign. Unfortunately, all the books do not possess a merit equal to the importance of the subject. A reviewer gets rather weary of scanning histories of the early investigations by Caley, Strongfellow, and the others. All honour to them! but repetition, even of the deeds of our worthies is apt to pall. Mr. Grahame-White tells this story twice, which is once too often. The first time he tells it very well. I admit that I did not read the second account very carefully. The story of early flights, Bleriot across the Channel, and the Paulhan-Grahame-White race from London to Manchester has also been told before, but probably it will be fresh to many readers of this book. The chapter on the war is very sketchy, and the succeeding one on the great flights just after the war (Alcock, Ross Smith, and others) seems either too short or too long. Mr. Grahame-White gets more interesting when he talks about the present and the future, but he is surely rather optimistic when he takes for granted all that Dr. Rumpler hopes that his projected large flying boat will do. We read that its estimated speed is 190 m.p.h., and that "even with 170 people on board, passengers and

crew, this great craft will be able to leave the water with sufficient to enable it to fly 3,750 miles without alighting. We only hope it will. But we may express doubts about the seaworthiness of any existing or projected flying boat when down on the Atlantic in a gale. What will happen to the wing-tip floats or the stabilisers? Or if the twin-hull plan be adopted, what experience have we of its seaworthiness? Mr. Grahame-White appears to have no doubt on the subject, but for our part we are not yet prepared to take shares in a company which intends to operate flying boats commercially across the Atlantic. This implies no lack of confidence in the flying-boat when properly used. It is sure to have a great future, but, as with other forms of aircraft, extravagant expectations may do it more harm than good. Finally, Mr. Grahame-White calls for a lavish expenditure of money by the Government in establishing air services. He mentions the figure of 10,000,000 per annum for 10 years. We prefer the idea of more gradual development, and so will most tax-payers.

F. A. DE V. R.

\* *Flying, an Epilogue and a Forecast*. By Claude Grahame-White (Chatto and Windus). Obtainable from FLIGHT Office. Price 12s. 6d.

## A VERY READABLE BOOK\*

It is very seldom that I have agreed with a publishers' introductory effusion to any of the prolific crop of books on flying which have been published during the past few months. Mr. F. C. Chichester's book, "Solo to Sydney," is, however, a notable exception. In the introduction John Hamilton states that "Mr. Chichester has proved himself, although a novice in writing, to be an expert writer, for he carries his reader with him in his 'plane the whole course of the journey"—a sentiment with which I heartily agree. This book is undoubtedly one of the most readable and most worth reading which it has been my lot to review for a very long time. It is, obviously, true that Mr. Chichester has had no great experience in either flying or writing, but, whereas he appears to have conquered the majority of difficulties in flying by intense and persevering application to the job, in his book he has at his first attempt produced a record of his flight which it is extremely difficult to leave, once one has started reading it. His style is naive, but very pleasant: it is sincere and full-bodied without being superficial or flippant. He shows that he has a keen insight into all sides of human nature and that type of observation which makes life worth living. Throughout the book his comments upon people and things are full of interest, and while they cover a very wide range of things which affected him during his flight, they are never irrelevant. His style and construction certainly leave one with the impression that this is his first book, but whereas with many people this fault produces a somewhat annoyingly amateurish effort, it has in this case produced an extremely interesting and coherent account of the journey from what might have otherwise been a dry and uninteresting diary of the trip. I imagine that a large amount of the success of this book is due to careful editing, but the fact remains that it is one which will be read and re-read by all who are interested not only in flying, but in the ambitions of youth widely conceived and tenaciously carried through to the bitter end. As is usual, the Daily Press did their level best to nullify the effects of his achievement with their ludicrously inaccurate splash headlines—as, for example, referring to him as "a rich young man" and such-like things; and it still further enhances the value of his flight that he succeeded not only without their preliminary backing, but also in spite of their subsequent mis-statements of his circumstances.

With regard to the printing, it seems incredible that in a publication of this class a proper sign for "degrees" was not used instead of a mutilated figure 8.

"DAEDALUS"

\* *Solo to Sydney*, by F. C. Chichester (John Hamilton, Ltd.). Obtainable from FLIGHT Office, 7s. 6d. net.

## Fine Service by De Havilland "Hercules" Aircraft

At the close of 1926 the de Havilland Aircraft Co., Ltd., built and supplied to the order of Imperial Airways, Ltd., five 14-seater, three-engined "Hercules" air liners for operation on their Middle East route. Interesting figures have just been received relating to the flying record of three

of these machines, which have been in constant commission since the service began early in 1927. The record shows very big mileages and remarkable consistency, as follows:—Hercules aircraft G-EBMW, 171,696 miles, 1,971½ hours; G-EBMX, 182,152 miles, 2,105½ hours; G-EBMY, 178,409 miles, 2,075½ hours.



# THE ROYAL AIR FORCE

London Gazette, December 23, 1930.

## General Duties Branch

The following Pilot Officers are promoted to rank of Flying Officer (Oct. 14): H. E. Maves, C. S. Millar, R. Smith.  
Flying Officer G. Fachiri resigns his short-service commn. (Dec. 10); the short-service commn. of Pilot Officer on probation R. O. F. King is terminated on cessation of duty (Dec. 23); Lt. G. R. F. T. Cooper, R.N., Flying Officer, R.A.F., ceases to be attached to R.A.F. on return to Naval duty (April 23) (substituted for *Gazette*, April 22); Lt. R. H. Barrett, R.N., Flying Officer, R.A.F., relinquishes his temp. commn. on return to Naval duty (Sept. 25). Flying Officer F. Read is dismissed the service by sentence of General Court Martial (Dec. 16). Flying Officer H. W. Charnock is cashiered by sentence of General Court Martial (Dec. 12).

## Medical Branch

Flt.-Lt. V. V. Brown, L.R.C.P. and S., is transferred to Reserve, Class D (ii) (Dec. 21).

## Chaplains Branch

Rev. R. E. V. Hanson, O.B.E., M.A., relinquishes his appt. as Hon. Chaplain to the King on retirement from R.A.F. (Dec. 11).

## ROYAL AIR FORCE INTELLIGENCE

**Appointments.**—The following appointments in the Royal Air Force are notified:—

### General Duties Branch

The following officers are all posted to R.A.F. Depot, Uxbridge, on transfer to Home Establishment, with effect from the date indicated:—  
**Wing Commanders:** A. Shekleton, D.S.O., and R. S. Maxwell, M.C., D.F.C., A.F.C.; 2.11.30. T. E. B. Howe, A.F.C.; 22.11.30.  
**Squadron Leader** D. E. Stodart, D.S.O., D.F.C.; 2.11.30.  
**Flight Lieutenants:** W. J. Seward, C. A. Horn, and W. H. Golder, D.S.M.; 2.11.30. C. N. H. Bilney; 14.11.30. V. P. Feather; 19.11.30. J. B. H. Rogers; 14.11.30. R. N. Waite; 21.11.30. J. E. L. Drabble; 24.11.30. H. M. Groves; 14.11.30. C. Feather; 14.11.30. W. H. Burbury; 14.11.30.  
**Flying Officers:** H. C. Marett, J. Marson, P. W. M. Wright, G. F. Overbury, A. C. Mitchell, and J. C. Jeffrey, M.C.; 2.11.30. H. G. Wheeler; 14.11.30.

### Stores Branch

**Squadron Leaders:** G. Stevens, O.B.E.; 2.11.30. P. J. Murphy; 19.11.30.  
**Flight Lieutenants:** J. K. McDonald, E. A. Tottle, and W. St. J. Littlewood; 2.11.30.  
**Flying Officers:** F. W. Felgate, R. B. Brown, and H. D. Jackman; 2.11.30. J. F. Young, M.M.; 19.11.30.

## RESERVE OF AIR FORCE OFFICERS

### General Duties Branch

Pilot Officer on probation M. J. Creswell is confirmed in rank (Dec. 11). The following are transferred from Class A to Class C:—Flt.-Lt. A. M. Blake, A.F.C. (Sept. 16); Flying Officer C. Thomas (Dec. 23); Flying Officer C. F. Roupell (Dec. 3). Flying Officer A. F. Fleetwood-Lawton is transferred from Class AA (ii) to Class C (Dec. 20).

The following relinquish their commns. on completion of service:—Flt.-Lt. E. E. Deans, D.S.C. (Oct. 24); Flying Officer H. C. E. C. P. Dalrymple (Sept. 2). The following relinquish their commns. on completion of service and are permitted to retain their rank:—Sqdn. Ldr. J. R. Howett (Oct. 24); Flying Officer L. S. Punnett (Oct. 12).

### Stores Branch

Flying Officer W. A. Kyte relinquishes his commn. on completion of service and is permitted to retain his rank (Sept. 12).

### Medical Branch

Flying Officer R. S. Maclachy relinquishes his commn. on completion of service (Aug. 11).

## AUXILIARY AIR FORCE

### General Duties Branch

No. 600 (CITY OF LONDON) (BOMBER) SQUADRON.—The following to be Pilot Officer:—N. T. Tangye (Oct. 25).

### Accountant Branch

Wing Commander H. G. Jones; 2.11.30.  
Flight Lieutenant J. H. S. Richards; 2.11.30.

### Medical Branch

Group Captain A. V. J. Richardson, O.B.E.; 2.11.30.  
Wing Commander H. B. Porteous; 3.12.30.  
Flight Lieutenants: P. B. L. Potter and G. W. Paton; 2.11.30.  
Flight Lieutenants: F. E. Lipscomb; 18.11.30. J. H. Cullinan; 18.11.30.  
Flying Officer W. King; 18.11.30.

### Chaplains Branch

Rev. W. P. Hughes, to R.A.F. Training Base, Leuchars; 2.11.30.

## NAVAL APPOINTMENTS

The following appointments were made by the Admiralty on December 20:—  
**Lieuts.**—(Flying Officer, R.A.F.)—S. T. Morgan, to *Victory*; Dec. 29. J. H. McI. Malcolm and H. Wright, to *Glorious*; Jan. 27. T. P. Coode, to *Glorious*. J. D. C. Little, to *Victory*.

## THE ROYAL AIR FORCE MEMORIAL FUND

The Executive Committee of the above Fund held its last meeting of the current year at Iddesleigh House, Caxton Street, London, S.W.1, on December 10. There was a large attendance, Sir Charles McLeod, Bart., in the Chair, Dame Helen Gwynne-Vaughan, G.B.E. (Deputy Chairman) and nine Members of the Committee, including six senior officers of the Royal Air Force, who are Members of the Committee.

A letter accepting membership of the Committee (he being one of the original Members appointed to the Committee in 1919 on its formation) was received from Air Vice-Marshal Sir Robert Brooke-Popham, K.C.B., who has recently arrived home from service in Iraq and has taken over the command of the Imperial Defence College in London.

It was announced to the meeting that the Vanbrugh Castle School, administered by the Fund, with 37 boys in attendance, would close for the Christmas holidays on December 17, 1930, and would re-assemble on January 6, 1931.

The Secretary formally reported to the Committee that the usual brief ceremony at the R.A.F. War Memorial on the Victoria Embankment, London, was carried out at noon on Sunday, November 9, 1930, when Air Chief Marshal Sir John Salmond, K.C.B., Chief of the Air Staff, laid a wreath, provided by the Fund, on behalf of the Royal Air Force and the Executive Committee of the R.A.F. Memorial Fund. At the same time wreaths were deposited at the foot of the Memorial by Representatives of the Dominions of Canada and New Zealand, by the Members of the W.R.A.F. O.C.A. and by other bodies and persons. Similarly, a brief ceremony was held in conjunction with the Royal Navy and the Army at the "Stone of Remembrance," opposite St. Giles' Cathedral, Edinburgh, on Armistice Day, Tuesday, November 11, 1930, when the Officer Commanding, R.A.F. Station, Leuchars, laid a wreath on behalf of this Fund, and of the Air Force, at the joint ceremony which took place on the above-named date.

The undermentioned were notified to the Committee as having accepted invitations to join the list of Vice-Presidents of the Fund:—The Right Hon. the Lord Amulree, G.B.E. (Secretary of State for Air); C. T. de Water, Esq. (High Commissioner for the Union of South Africa); Sir Thomas Wilford, K.C.M.G. (High Commissioner for the Dominion of New Zealand); and the Committee directed the Secretary in addition to ask the new High Commissioner for Canada, Mr. Ferguson, if he would join the list of Vice-Presidents on his arrival to take up his appointment in England at the end of this year or at the beginning of January next.

The Committee appointed a Sub-Committee to deal with the preparation of the Annual Report for 1930, which will be commenced early in the New Year and with a view to curtailment of the previous reports, which are considered to be somewhat too lengthy. The Sub-Committee is composed as follows:—Dame Helen Gwynne-Vaughan, G.B.E. (Chairman); Air Marshal Sir Edward Ellington, K.C.B.; Air Vice-Marshal C. A. H. Longcroft, C.B.; The Secretary.

The following dates were provisionally approved for Executive Committee Meetings during 1931. All meetings to be held on Wednesdays, the dates being March 4, April 29, July 1, October 7 and December 9, 1931, at 3 p.m.

The usual meeting of the Grants Sub-Committee of the Fund was held on November 27. Mr. W. S. Field was in the Chair, and the other Members of the Committee present were:—Mrs. L. M. K. Pratt-Barlow, O.B.E.; Air Commodore B. C. H. Drew, C.M.G.; Squadron Leader A. H. Wann. The Committee considered in all 12 cases, and made grants to the amount of £39 13s. 6d.

At the meeting of the Grants Sub-Committee held on December 16, Lieut-

## AIRCRAFT APPRENTICES

### Halton

AIR VICE-MARSHAL H. C. T. DOWDING, C.B., C.M.G., inspected the School of Technical Training (Apprentices) at Halton on December 16. The A.O.C. Halton, Air Commodore I. M. Bonham-Carter, C.B., O.B.E., in his spoken report remarked that 351 apprentices were due to pass out, of which 141 had been trained as Aero Engine Fitters, 189 as Metal Riggers, 12 as Armourer Fitters, and 9 as Coppersmith and Sheet Metal Workers. At the final examination 37 qualified as Leading Aircraftmen, 266 as Aircraftmen First Class, 41 as Aircraftmen Second Class, 6 were sick and were not examined, and one failed to qualify. The technical training results showed a good average. This was the first entry which had received instruction in the trade of Metal Rigger. When the entry arrived at Halton the educational average was low. By special attention on the part of the staff, the lowest classes had been brought along. Discipline had been good and health satisfactory. Cadetships had been offered to E. G. J. Jacobs, S. P. A. Patmore, P. R. Robinson, J. C. Pope, and M. K. D. Porter.

### Electrical and Wireless School, Cranwell

Air Vice-Marshal A. E. Borton, C.B., C.M.G., D.S.O., A.F.C., Commanding the Inland Area, inspected the Electrical and Wireless School at Cranwell on December 17. The A.O.C. Cranwell, Air Vice-Marshal A. M. Longmore, C.B., D.S.O., in his spoken report said that the January, 1928, entry, which was then passing out, was an exceptional one. The average of intelligence and the standard attained was in most cases above the average. He paid a high tribute to the work of the staff. The discipline had been good, and had improved as the course went on. At the Central Trade Test Board Examination, 14 apprentices qualified as L.A./C., 18 as A./C. 1, and six as A./C. 2. There were no failures.

## New Squadron to Form at Manston

THE Air Ministry announces that No. 500 Cadre Squadron will form at Manston on November 16, 1931, under arrangements to be notified later. This unit will be a night-bomber squadron, and will occupy the accommodation lately vacated by No. 9 B.S. which has moved to Boscombe Down on Salisbury Plain. There are at present four cadre squadrons in the Royal Air Force, namely, No. 501 (City of Bristol), No. 502 (Ulster), No. 503 (County of Lincoln) and No. 504 (County of Nottingham). The Ulster and Lincoln Squadrons use the Hyderabad and are night-bombers. The Bristol Squadron uses the D.H.9A, and the Nottingham Squadron uses the Horsley. A cadre squadron has a substantial proportion of regular personnel, including the C.O., but is brought up to strength by officers and airmen of the Special Reserve Air Force. There is no exact equivalent to this organisation in the Army. We presume that the location of this new squadron at Manston is a temporary arrangement, as the aerodrome has been condemned as a permanent station for a bomber squadron of the Air Defences of Great Britain, and for that reason No. 9 B.S. has been moved away from it.

## MODELS

## SOCIETY OF MODEL AERONAUTICAL ENGINEERS

## Annual Prize Distribution

THE annual prize distribution of the S.M.A.E. was held at the Y.M.C.A., Tottenham Court Road, W.C.2, on December 11. Mr. A. F. Houlberg (chairman) presented the prizes to the various successful competitors in the competitions for 1930.

The following dates for competitions during 1931 (flying grounds to be announced later) were then decided upon:—March 28, Gamage Cup; April 11, Kite and Model Aeroplane Association Cup; April 25, Pilcher Cup; May 9, "Model Engineer" No. 2 Cup; March 23, "Flight" Cup; June 20, Sir John Shelley Cup; July 11, S.M.A.E. Cup (Speed); July 25, Weston Cup; August 29, "Model Engineer" No. 1 Cup; September 12, Lady Shelley Cup; October 10, Freshmen's and Visitors' Competition; October 31, Photographic Competition Closes.

The meeting closed with a hearty vote of thanks to the chairman, proposed by Mr. Yeomans (T.M.A.C.).

S. G. Mullins (Hon. Sec.), S.M.A.E., 72, Westminster Avenue, Thornton Heath, Surrey.

## THE "B.O.P." FLYING LEAGUE

LARGELY as the result of a consultation with the late Sir Sefton Brancker, the Editor of the *Boys' Own Paper* is forming a league known as the "Skywaymen." The main objects of the "B.O.P." Flying League—which will be affiliated to the S.M.A.E.—are: To develop "fair-mindedness" among boys and girls throughout the British Empire. To foster the sport of Model Flying. To encourage the home-construction of Model Aircraft for this purpose. To win back and retain in this country the Wakefield International Cup for Model Flying. To help to place, and keep, Britain and the British Empire first in every department of flight. Membership is open to all readers of the "B.O.P." of either sex and any age. They may be admitted in one of the following classes:—(a) Skywaymen. Those interested in flight, who have not yet taken up model flying. (b) Skywaymen-Pilots. Those who fly bought planes. (c) Skywaymen-Rigger-Pilots. Those who intend to build and fly their own models.

## CONSTRUCTORS' SPECIAL NOTICES

## De Havilland Notice to Owners and Operators of Puss Moths

**Puss Moth Induction Pipe Heater.**—In the original design of the heater box for the Gipsy III engine fitted into the Puss Moth, the exhaust outlet was led away by a short pipe through the side of the cowling. It was found at an early date that the exhaust from this pipe rapidly deteriorated the paint work in the vicinity of the outlet, thus spoiling the general appearance of the cowling.

On more recently manufactured Puss Moths the location of this outlet has been altered so as to allow free use of the heater box without the disadvantage of damaging the paint work. On some original Puss Moths the outlet pipe was blanked off with a detachable cap which, with the cap in place, rendered the heater box inoperative. It is found in practice, however, with the approach of colder weather conditions, that the use of the heater box definitely improves the running of the engine, and it is, therefore, now strongly recommended that all operators of Puss Moths which have the original pipe should put the heater box into operation by removal of the blanking cap. In order that owners shall not suffer the annoyance of damaged paint work, The De Havilland Aircraft Company has developed and perfected a simple modification which, by attachment to the exhaust outlet pipe, leads the gases away in the same manner as on the latest type of Puss Moth.

Should any owner wish to take advantage of this modification, the necessary parts can be obtained on application to the Service Manager, Stag Lane Aerodrome, Edgware, Middlesex. It is particularly requested that machine and engine number shall accompany every application.

(No. 4, December, 1930.)

## De Havilland Notice to Owners and Operators of Gipsy II and III Engines.

**Cylinder Overhaul.**—During cylinder overhaul opportunity should be taken to modify pistons of the following types: No. 800-15A and 800-15C, should they be fitted.

The modification consists of reducing the skirts of pistons to a minimum overall length of 70 mm., measured from the crown of the piston. The excess metal can be turned off or removed by hand. The barrel portion of the skirt where it meets the cross web should be radiused off at 5 mm. radius, and all sharp edges on the bottom of the skirt must be removed. Pistons should be accurately weighed after shortening, and any piston weighing less than 24 oz. 7 drams, should be replaced by a new part.

Gudgeon pins, washers and circlips to part Nos. 1,300-17, 1300-18, 1300-19 should be replaced by improved types, part Nos. 800-17, 800-18, 800-19, which can be obtained on application to the Service Manager, The de Havilland Aircraft Co., Ltd., Stag Lane Aerodrome, Edgware.

**Note.**—The old type of gudgeon pin is reduced in diameter at the ends to take the washer and circlip. The new type is of uniform diameter throughout.

(No. 5, December 16, 1930.)

## AIR MINISTRY NOTICE TO AIRCRAFT OWNERS AND GROUND ENGINEERS

## Avro 504 Aircraft: Provision of Fireproof Bulkhead

1. The fireproof bulkhead for Avro 504K aircraft with Mono-Gnome engines, described in Notice to Aircraft Owners and Ground Engineers No. 19, of 1930, will also be accepted as adequate for the 130 h.p. Clerget and 110 Le Rhone engined aircraft, provided that with these engines airtight air intake pipes with gastight joints to the carburetors are also fitted.

2. This will comprise the minimum acceptable fireproofing for these aircraft, but will not preclude the use of other methods of fireproofing, such as that described for the Le Rhone and Clerget engined aircraft in Notice to Aircraft Owners and Ground Engineers No. 19, of 1930, if desired.

(No. 46 of 1930.)

## PUBLICATIONS RECEIVED

*Marine Aircraft Elementary Naval Architecture.* By P. H. Sumner. London: Crosby, Lockwood and Son. Price 16s. net.

*Light Aero Engines.* By C. F. Caunter. London: Sir Isaac Pitman and Sons, Ltd. Price 12s. 6d. net.

*Pictorial Calendar, 1931.* "At the Foot of the Rockies"—Blackburn "Lincok." The Blackburn Aeroplane and Motor Co., Ltd., Amberley House, Norfolk Street, London, W.C.2.

*Aircraft Depot Magazine.* Vol. 1. No. 2. October, 1930. Royal Air Force Depot, Karachi, India.

*Aerial A.B.C. September-November, 1930.* The Aerial A.B.C., Ltd., 4, Duke Street, Adelphi, W.C.2. Price 1s.

*The South American Handbook, 1931.* Trade and Travel Publications, Ltd., 14, Leadenhall Street, London, E.C.3. Price 2s. 6d. net.

*Know Your Car: A Simple Story of the Motor Car.* Anglo-American Oil Co., Ltd., 36, Queen Anne's Gate, Westminster, London, S.W.1.

*The Air Pilot (Vol. 1) Monthly Supplement, No. 15, November, 1930.* H.M. Stationery Office, Kingsway, London, W.C.2. Price 6d. net.

*Airmanship.* By J. McDonough. London: Sir Isaac Pitman & Sons, Ltd. Price 7s. 6d. net.

*Navigational Instruments.* Kelvin Bottomley and Baird, Ltd., 18, Cambridge Street, Glasgow.



## NEW COMPANIES REGISTERED

GLASGOW GLIDING CLUB, LTD., 161, North Street, Glasgow, C.3. Registered in Edinburgh as a company limited by guarantee, without share capital. Objects: To acquire, develop and extend the club now carried on as the Glasgow Gliding Club. The subscribers are:—G. Cameron, Craighard, Bearsden, motor agent; A. Y. Paton, 70, Exeter Drive, Glasgow, W.1, draper; C. Caplan, 77, South Portland Street, Glasgow, W.1, student; A. Campbell Mitchell, Beardmore, Kilmarnock Road, Whitecraigs, Renfrewshire, engineer; T. P. Graham, 7, Broomhall Street, Glasgow, S.S., engineer; J. K. Mackintosh, 11, Park Road, Newlands, Glasgow, engineer; A. H. Anderson, Verreville, Lenzie, Dumbartonshire, optician; Secretary, A. Hector.

ROADWAYS AND AIRWAYS, LTD., Holborn Viaduct House, 12, Holborn Viaduct, E.C.1.—Capital £10,000, in 8,000 10 per cent. cumulative participating preference shares of £1 and 40,000 ordinary shares of 1s. each. Transporters of persons, goods, or otherwise by land, sea or air, etc. First director, H. W. Sale, 41, Holland Road, Kensington, W.14, technical photographer.



## AERONAUTICAL PATENT SPECIFICATIONS

(Abbreviations: Cyl. = cylinder; i.e. = internal combustion; m. = motors. The numbers in brackets are those under which the Specification will be printed and abridged, etc.)

## APPLIED FOR IN 1929

Published January 1, 1931

- 16,789. G. H. TRISTRAM and C. BUCKLE. Anti-aircraft prediction apparatus. (339,294.)  
26,676. O. G. HALVORSEN. Screw propellers. (339,248.)  
28,536. W. V. GILBERT. Aircraft. (339,382.)  
28,920. F. S. WIGLEY and L. F. AUSTING. Harness for airmen. (339,388.)  
29,597. M. CASTRO. Cargo-handling apparatus for aircraft. (339,401.)  
37,319. F. MAZZINI and SOC. ITALIANA E. BREDA. Structure of monoplane with thick wings. (339,486.)

## APPLIED FOR IN 1930

Published January 1, 1931

- 33,846. G. H. TRISTRAM and C. BUCKLE. Anti-aircraft prediction apparatus. (339,322.)  
33,847. G. H. TRISTRAM and C. BUCKLE. Apparatus for determining the speed of aircraft. (339,361.)

## FLIGHT, The Aircraft Engineer and Airships.

36, GREAT QUEEN STREET, KINGSWAY, W.C.2.

Telephone (2 lines): Holborn, 3211.  
Holborn, 1884.

Telegraphic address: Truditur, Westcent, London.

## SUBSCRIPTION RATES POST FREE

| UNITED KINGDOM |       | UNITED STATES |        | OTHER COUNTRIES* |       |
|----------------|-------|---------------|--------|------------------|-------|
|                | s. d. |               |        |                  | s. d. |
| 3 Months       | 8 3   | 3 Months      | \$2.20 | 3 Months         | 8 9   |
| 6 "            | 16 6  | 6 "           | \$4.40 | 6 "              | 17 6  |
| 12 "           | 33 0  | 12 "          | \$8.75 | 12 "             | 35 0  |

\* Foreign subscriptions must be remitted in British currency.

Cheques and Post Office Orders should be made payable to the Proprietors of "FLIGHT," 36, Great Queen Street, Kingsway, W.C.2, and crossed "Westminster Bank."

Should any difficulty be experienced in procuring "FLIGHT" from local news-vendors intending readers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.